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Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

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MINNESOTA MEDICINE

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JUNE, 1937

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PROMPT REPORTING AND COOPERATION WITH COMMISSIONS*

VOYTA WRABETZ

Chairman, Industrial Commission of Wisconsin

Madison, Wisconsin

THE major part of the burden caused by industrial accidents is an obligation which must be borne by industry. This proposition is no longer seriously questioned. Upon this principle benefits for disability or death because of accidents (and in some states because of occupational diseases) which arise out of and in the course of employment are the inherent right of workmen and are not philanthropy or charity to be doled out by a benevolent employer.

As an assurance that such benefits shall be adequately provided, workmen's compensation laws were enacted. To carry out the underlying theory of the laws completely and at the same time to stay within the law, the proper and reasonable administration of the law by Industrial Accident Boards or Commissions, by employers, by insurance carriers and especially by the medical profession, is absolutely necessary.

The workmen's compensation act of any state provides two-fold benefits: (1) competent and reasonably necessary medical, surgical and hospital treatment, and (2) compensation to the disabled employe or death benefits to the dependents of a deceased employe. While the payment of compensation is the most apparent purpose of the law, the primary effect of the law is that by the burden of its obligations it supplies the urge to prevent industrial accidents and to avoid those conditions of employment which cause industrial diseases.

A second primary purpose of the compensation law and one that is also more important than the payment of compensation, is the phys-

ical restoration of the disabled employe. The return to a self-sustaining, and when possible, to full earning capacity, is of tremendously greater value to a worker than any amount of compensation benefits that might be paid. It is, therefore, self-evident that the medical profession is a controlling factor in a compensation case because proper and sufficient medical treatment is of first importance in the process of rehabilitation. The speed with which medical treatment is rendered and the more proficient and skillful the medical attendance which is furnished, the more complete will be the attained rehabilitation.

Workmen's compensation laws usually place the cost of medical attendance and treatment upon the employer. In many states, because of this obligation, the employer is granted the right to name a panel of doctors from which the employe may select the physician or surgeon who shall treat and attend him. This provision operates, at least to some extent, to take from the injured employe the age-old privilege of selecting the physician who is to attend him and, to the same degree, to give to the employer the choice of the physician in whose care the employe is placing not only the repair of broken limbs, but of life itself.

There are certain well-founded reasons for giving to the employer and placing upon him the responsibility of furnishing proper medical attendance for the care of the injured. First, the employer, for purely selfish reasons, is interested in the speedy recovery of the employe with the least possible permanent disability in order to reduce compensation costs. For this reason, if for no other, the employer is more likely to

*Read at the annual meeting of the Minnesota State Medical Association, St. Paul, May 4, 1937.

provide the best available medical treatment. Second, the injured man sustains a disabling injury usually not more than once in his lifetime and because of this lack of contact does not possess knowledge as to the qualifications of physicians or surgeons. On the other hand, the employer of even as few as from fifteen to fifty workers, generally has better knowledge of the specialties and qualifications of available physicians and surgeons. Consequently he is in a position, not only to furnish medical treatment promptly, but, because of experience, is able to secure the care and treatment which each particular case demands.

While as indicated, the employer has much to do with the selection of the physician or surgeon for the care of an industrial injury or disease, in these states there still remains some choice on the part of the employe. He need not accept the service of one doctor if that doctor is the only one offered unless no other is available in the community. The employer is required to present the employe with a panel of names from which a choice may be made.

Because of the progress which has been made in industrial surgery and because more and more doctors have given much of their time and study to a better understanding of the problems involved, this provision of the compensation law is being invoked less than formerly. Today, it is the rule rather than the exception, that the employe is permitted to engage the services of any doctor without the intervening tender of a panel.

Because of these various considerations and even in states in which the employe may freely choose his doctor, the position of the physician under the workmen's compensation law is unique. The relationship of a physician to his patient is one of the most confidential of relationships in human life and has always been treated as an exclusive privilege. In cases of sickness or injury, in order to obtain the best results, a person must place himself in a position of complete dependence upon his physician. Therefore, the physician assumes a position of great responsibility; he has been selected, or is paid for his services, by one (the employer) to undertake the care of another (the employe). His duty is twofold: one to the injured who places in him all his hope and faith and the other to the employer

who pays him for his services. In view of this dual relationship, the physician is placed in a most unusual position and enjoys a privilege not possessed by any other class of men or profession. It is well, therefore, for the doctor to remember that, although he is paid for his services by the employer, he nevertheless is the employe's physician, because it is the employe who is to be adequately treated and adequately and fairly compensated.

The first consideration which the attending physician should give in the treatment of his case, is to give that treatment which is most likely to result in the best possible physical restoration. To this end the old adage that two heads are better than one has special application. In serious cases where there is question as to what ought to be done or when the case may be out of the field of the experience of the attending physician, consultation is desirable. Under such circumstances, the advice of another physician, and, more particularly, of a specialist, should be sought and, when tendered by the employer or insurance carrier, should be welcomed without any thought of the attending physician being subordinated in the case.

As a definite part of treatment in order to accomplish speedier and more complete rehabilitation, the facilities of curative workshops may be valuable. It is my experience that these workshops have materially reduced the periods of temporary total disability and have also lowered the amount of ultimate permanent impairment. Of course, physiotherapy should always be done under the direction of a physician. Under such proper direction, the physician should make use of any well-equipped workshop if reasonably available.

The attending physician plays a most important rôle and has a very important duty to perform at the end of the healing period. In view of the fact that compensation benefits are only a fraction of the actual wages of an injured man, it is extremely important to the injured himself that he return to work as soon as possible to stop the daily loss represented by the difference between his full wage earnings and what he gets as compensation. The early return to work is likewise important to the employer who is meeting the compensation liability. It is this point over which there arises considerable controversy be-

tween the employer and the injured man.

The time in which an injured man is able to return to work is of vital importance to the patient, therefore, the case of his compensation has been his patient's advice is published.

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tween the injured employe and the employer or the employer's insurance carrier.

The surgeon should always have this crucial time in mind in the treatment of his case. The injured has, up to this time, not only suffered the pains of his injury, but has himself suffered from the loss of a full pay envelope, sometimes resulting in the curtailment of even the necessities of life, not only for himself, but for his entire family. At this moment in his life, he is not particularly happy because he is thinking of a return to work with his new handicap and with many limitations. In order to meet this crisis in the care and treatment of the injured man, it is vital that the attending physician truly gain the confidence of his patient, that confidence which a patient gives to a private surgeon. It becomes, therefore, apparent that in the handling of a case the surgeon must convince the employe of his complete fairness and impartiality. If he has shown in his conduct that his interest is in his patient, the employe will, ordinarily, take his advice and the return to work will be accomplished as an incident of treatment.

When an injured employe returns to work, the physician owes two definite obligations. The first is to the injured employe. The worker should be definitely advised not only as to the class of work he is able to do for wage earning purposes but, more particularly, the kinds of work it will be well for him to refrain from and also the kinds of work actively to engage in, in order to bring about the best possible rehabilitation. The physician's second duty is to give the same instructions, most emphatically, to the employer, either directly or through a representative of the insurance carrier. In this respect the foreman in whose charge the injured employe's work is done, should be impressed with the fact that a man who has been injured and who consequently has some handicaps and limitations is now back at work and that he must do everything necessary to complete the treatment of the case under the supervision of the attending physician. The injured employe should not be required, upon return to work, to fight his battle alone, not only with his own aches and pains, but with the foreman who may not be entirely in sympathy with him and who does not want him, a physically unfit man, in the plant. Too often the attending physician makes a re-

port of the end of the healing period to the agency which pays compensation and leaves the adjustment of the injured to employment to the hazard of misunderstanding, both from the standpoint of the injured and the foreman. It frequently occurs that an injured man is not told by his attending physician that he is able to return to work, nor is any report made to the employer or insurance company of the kind of work which the injured can do. The situation then becomes ripe for an argument and a subsequent contested case. Much can be done to bring about not only a harmonious relationship between the injured and his employer, but also a proper termination of the period of temporary total disability and a proper adjustment of compensation for such disability by a frank expression, both to the injured employe and to the employer.

Under all compensation laws, an injured employe is required to resume some suitable form of work as soon as he can. The mere healing of wounds does not terminate the so-called "healing period" and before the physician leaves his case he should be able to convince his patient that he is able to resume the form of work available to him, taking into account the kinds of work he was able to do before his injury. If he has maintained that proper attitude which the ethics of his profession towards the sick and infirm requires, he will be able to accomplish this end. In most cases, of course, the injured has been away from work for a long period of time and it is difficult for him to resume work, even aside from the disability that results directly from the injury. This, together with the actual physical defects, makes it doubly hard for the injured to return to work and in such cases it is usually well to advise the lengthening of the period of temporary total disability for several weeks and sometimes, as a rehabilitation measure, even when the employe has actually returned to work.

I trust it may not be out of place at this point for a layman to give a word of caution as to the handling of certain cases, namely, the possibility of neurosis following an injury. Needless to say, a true neurosis, while it is a result of some quirk of mental reaction, is nevertheless real. This condition almost always presents a difficult and pitiable case for solution. A sad feature of the case is the fact that often the condition

is brought about by some indiscreet suggestion from those who have the injured employe's interests most at heart and, yes, even by attending or examining physicians. Doctors knowing the possibilities of the development of a neurosis, can do much in their contacts with the injured and with members of his family to reduce the toll in this regard. Here again the building up of complete confidence in the ability and, especially, in the integrity of the attending physician plays an important rôle.

The compensation law provides for the payment of compensation not only during the period of temporary total disability, but also for permanent disability. In the determination of such permanent disability, all interested parties must depend upon the opinion of the physician. While it may be true that laymen and particularly members of an accident board or commission and those who have to do with the administration of compensation laws acquire some knowledge as to the kinds of disabilities that follow from certain injuries, in the last analysis the determination of just what disabilities are sustained is peculiarly in the field of the medical profession.

The purpose of the compensation law is to give to the injured employe such benefits that he shall be adequately compensated for the disability occasioned by injury. The man who has been injured is not in a position to face the world in a happy mood and particularly so if compensation paid to him does not in a reasonable degree compensate for the disability sustained. When this important question to the employe is being considered, the surgeon should not forget that he is still the physician of a particular patient and in estimating disabilities should never take into account the fact that he is being paid for his services by another agency.

Human beings are usually fairly optimistic and particularly so when it comes to judging the results of their own acts. If we have pride in our work, and we ought to have, we are apt to think that our work probably could not be improved upon. Therefore, may I add a word of caution and suggest that the surgeon should not be too sanguine in judging the results of his own work. The results may have been the best obtainable, but because they are the best obtainable, it does not follow that an injured member has been restored to perfect normality. Therefore, the sur-

geon should be particularly alert to be impartial and fair in rating or appraising the disability, so as to give the injured man all that he is entitled to.

It is always well for the medical men to become thoroughly familiar with the compensation law of the state in which they practice and particularly with its administration, so that their reports and opinions may have meaning. But in estimating disabilities, the surgeon should never take into account the amount of money which is to be paid, but rather should give his estimate of disability and "let the money fall where they may." Estimates of disability should always be based upon the ultimate result attained after the return to work.

At this point, it might be of interest to point to other facts which show that the medical aspect of any workmen's compensation act is very important. These facts are of particular interest and importance to physicians and surgeons as participants in this phase of the law.

In the administration of the workmen's compensation law, all compensable cases are required to be reported. These reports include a statement of the entire medical costs involved. In Wisconsin, from September 1, 1911, to December 31, 1935, in the 396,379 cases reported, employers have paid \$18,779,395 for medical, surgical and hospital treatment. These figures do not include the many thousands of cases which involve less than three days disability but which required medical treatment. While we do not have a record of such cases, the medical costs were undoubtedly large.

I have heard that employers have criticized the medical profession, feeling that some doctors step up their bills under the system where payment is more certain because made by an insurance company. Medical bills have increased per case for a number of years as shown by the fact that in 1920 the average per case was \$35, in 1925 it was \$52, in 1930, \$70, while in 1935 it was \$50. The drop in 1935 is probably due to the fact that there was a decline in employment in the heavy industries during that period and consequently a reduction in the number of more serious accidents. While in some isolated cases the complaints may be well founded, I believe that the criticisms generally are not warranted and that the increase is due to the fact that bet-

ter medical service is being given, resulting in shorter periods of disability and in more nearly complete restoration of injured employees.

I now wish to discuss briefly compensation payable under the schedules contained in some compensation laws, as in Minnesota and Wisconsin. These schedules usually include amputations of various members or their parts and the loss of vision and hearing. Any injury short of amputation is compensated for on the basis of a relative loss. This means that the loss is estimated as being a certain percentage of the allowance as contained in the schedule for the next greater rated disability. For instance, a disability which is limited entirely to the function of the forearm from the elbow to the tips of the fingers is one comparable to the loss of an arm at the elbow and not to the loss of an arm at the shoulder.

While no general rules can be laid down for the estimating of the loss of function, there are certain injuries, or rather conditions, which are more or less classical, such as the ankylosis of a knee joint, or a definite shortening of a leg. But even such conditions in different persons result in some variation in the percentage of loss of function, depending upon the adaptability of the patient. It is clear that some men with an inch shortening of one leg are unable to overcome the handicap, while others go about their work without any apparent increase of effort whatsoever.

Within limitations, it is possible to establish by custom or rule the related disability applicable to a given handicap. The Industrial Commission of Wisconsin, after many hearings with physicians and in coöperation with the State Medical Society, adopted a schedule of related disabilities to serve as a guide in rating disabilities. For example, a loss of function represented by a limitation of active elevation of the arm in all directions to 90°, but otherwise normal, is a loss of 20 per cent of the arm at the shoulder. If other conditions exist, the percentage of disability varies more or less as the disability varies from this standard.

This schedule has served a very useful purpose and has resulted in a better common understanding of what is meant by relative losses. It has resulted in a more uniform approach to the problem of rating or evaluating of disabilities.

Less than 15 per cent of all cases under compensation in Wisconsin are actually heard by the Industrial Commission; that is, less than 15 per cent result in disagreement as to the causal relationship between working conditions and disability or in the estimating of disability. In the remaining 85 per cent, the cases are closed upon the reports filed with the commission. When an injury occurs, the employer is required to file with the commission a report which contains answers to questions relating to the injury. When the case is finally closed, a final report must be filed by the employer together with a receipt signed by the employee. If the disability extends beyond three weeks, a physician's report showing the character of the injury and the disability sustained, both temporary and permanent, must also be filed. With these reports before it, the commission determines whether the injured is properly compensated. If all four documents are in agreement, the case is closed. The practice in many states is somewhat similar. In this plan of administration, you will readily see the importance of physicians' reports. The whole question of whether injured men are being properly compensated rests almost exclusively upon the judgment of physicians and, therefore, it is essential that such reports be carefully prepared, that they be complete and competent, so that the beneficent purposes of compensation laws may be fully carried out.

One of the principal reasons for the enactment of a compensation law was to provide for the speedy payment of compensation. Since an employer or insurance carrier cannot be expected to pay compensation unless they are reasonably sure that compensation is due, it is extremely important that the attending physician make immediate report to the employer or insurance company after first being called on the case, setting forth the nature of the injury and the probable period of disability. While the record of prompt payment of compensation is good, it certainly can be improved upon. A frequent reply to an inquiry made to an insurance company as to why compensation payments are not made promptly, is that it has not received and cannot get a report from the attending physician. In fairness to injured workmen, this should not be. I am sure that if attending physicians realize the importance of prompt and complete reports, they

will coöperate in the plan of administration, so that the injured man, in addition to the suffering occasioned by injury, will not at the same time suffer from worry due to shutting off his income. For this very obvious and beneficent purpose, I cannot plead too forcefully or urgently to attending physicians to report their cases to proper agencies completely and understandingly.

Contested cases, which usually number about 15 per cent of all cases, naturally give boards or commissions the greatest worry and concern. The bulk of these cases can be classified into two divisions, the first covering the determination of temporary or permanent disabilities when injury definitely occurs and the second the determination of the question of whether or not the disability complained of is either the result of injury accidentally sustained or of occupational disease. In the determination of either of these questions, the determining body must depend almost entirely upon the testimony of the medical profession.

The first of these questions is not so difficult and becomes difficult only when physicians will not use good judgment either as the result of bias or other cause. When in a given case one physician estimates that a permanent disability is 10 per cent loss of function of a leg at the hip and another estimates the identical disability at 80 per cent of loss of the leg at the hip, some one or maybe both are wrong. A leg cannot be disabled both 10 per cent and 80 per cent at the same time.

Workmen have complained that doctors whose bills are paid by employers or insurance companies have discriminated unfairly against the workmen in under-estimating the degree of disabilities. Opposite complaints are made by employers against doctors who are employed by workers. There are doctors who apparently are influenced by the side for which they are reporting or testifying. Such "influenced" reports or testimony do not confer a favor upon anyone and least of all upon the insurance carrier, which must be guided only by the real facts in the case.

After some years of experience and after seeing probably as many if not more actual cases than any one physician may see, it would be strange indeed if those who administer compensation laws did not have some fairly good idea as to how disabilities should be measured. It is

soon discovered whether or not a physician is giving to the case that unbiased thought and study which enables him to estimate disabilities properly and fairly. Physicians who do not, soon lose the confidence of the board or commission which must decide cases upon their testimony, and ultimately the confidence of their clients. Happily it can be said that members of the medical profession usually give honest judgments as to disabilities and that their estimates of disabilities are usually very close indeed.

The second field of controversy, which involves the question of whether or not the disability is the result of accident or occupational disease, offers more difficulty. As in the former class, boards or commissions must here likewise depend upon the medical profession. While medicine and surgery have made tremendous strides and particularly in the last half century, there is still much which medicine and surgery have not solved and which they do not know so far as cause and effect are concerned. In the determination of such questions it is important that the physician, who is called as an expert, give the scientific knowledge on the subject under investigation. Opinions based purely on conjecture have no probative force, whether they be on the one side or the other. The fair and unbiased scientist in any given set of facts will always give the reasonable probabilities from which a determination can be made. Boards or commissions are no more justified in arriving at a conclusion based upon the remote conjecture in the face of scientific probability in the case of a medical question, than they would be in arriving at a conclusion based upon conjectural inferences as to any other fact. Fanciful theories, on the one hand, that a condition is not the result of a definite injury in the face of a definite chain of events, or, on the other hand, that a disability may be due to injury when more reasonable causative factors are present, are of no particular value in the determination of medical questions.

It must be recognized that in the present state of medical knowledge there is bound to be a difference of opinion when the etiology and character of the disability is obscure. It is this very feature that renders some industrial cases peculiarly fascinating. However, this difference of opinion should never degenerate into partisan-

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ship. When it does, the physician ceases to be an impartial professional man and becomes an advocate, so that the value of his service to the administration of workmen's compensation laws becomes practically nil. For the purpose of determining medical issues, whether as a witness or when appointed to make an independent examination, it ought to be expected as a matter of course that the members of an old and honored profession will always give opinions really independent of their source of employment—fairly and impartially—and purely on the reasonable scientific probabilities applicable to the given situation.

If the foregoing analysis is correct, it must be apparent to all concerned in the administration of the compensation law, that its proper functioning depends largely upon the members of the medical profession. Because of the method of his selection, because the determination of compensation rights depends upon him,

and because he is exclusively responsible for the physical restoration and rehabilitation of the injured employee, the physician who engages in industrial surgery must be continually on the alert to maintain an absolutely unbiased and impartial attitude. The whole success of the compensation law depends upon him and the whole future of many thousands injured men each year depends not only on his skill, but upon his good judgment. It is to the great credit of the medical profession that compensation laws have generally worked out as successfully as they have. But "lest we forget," it is highly desirable that the medical profession shall steadily weed out its obnoxious members and that it shall ever be on the alert to keep its standards on a high level and, so far as the compensation laws are concerned, give to their administration that quality of judgment and attitude that will gain the fullest confidence of injured men and at the same time render to employers and to the public that impartial service to which they are entitled.

DIFFERENTIAL DIAGNOSIS IN ACUTE ABDOMINAL TRAGEDIES*

MAXWELL LICK, M.D.

Erie, Pennsylvania

THERE is nothing in medicine or surgery more dramatic than acute conditions within the abdomen. No drama moves more swiftly; no drama excites emotions to a higher pitch; no drama reaches its climax with greater speed than this calamitous and frequently cataclysmic event. No greater responsibility is ever borne than that by the chief actor in the piece, the physician.

The sufferer is frequently first seen under conditions unsatisfactory to the examiner. The light is poor, the bed is low, the room is small and is crowded with tearful, anxious relatives, among whom there is always one, with stern unfriendliness, who does not believe in hospitals or operations. All this often creates an atmosphere uncondusive to calm, logical thinking and clear judgment.

Amid these conditions or even among those

advantageous ones of the hospital, the surgeon is confronted with a problem of diagnosis. It is usually fascinating, but all too often blurred and confusing. Is the condition surgical, or are the abdominal signs and symptoms but a red herring drawn across the trail to confuse the examiner and conceal the true condition? The experienced and cautious surgeon recalls to mind his scars as mementos to gastric crises and ureteral calculi. He remembers a professor who opened an abdomen for a ruptured ulcer, only to find nothing; but frank pneumonia was present the next day. Remembering these things, the intellect is thus sharpened and the mental acumen brought to a finer focus. But the surgeon is also cognizant that to overlook an abdominal condition carries as great a responsibility as to mistake it for something else. Acute conditions within the abdomen usually require prompt and immediate action. Conditions amenable to treatment and a resulting cure, if attacked at the proper time,

*Presented at the annual meeting of the Minnesota State Medical Association, Saint Paul, Minnesota, May 5, 1937.

are often converted by inaction and indecision into hopeless tragedies, thereby making the surgeon as impotent as though he were a little child.

In most cases a diagnosis can be made by the history and clinical examination alone. In this mechanical age physicians have learned to depend too much on instruments of precision. We are likely to subjugate our God-given senses of sight, touch, smell, and hearing, which were developed to a high degree by such men as Osler, Holmes, Agnew, and Murphy, to instruments of precision and laboratory findings. I cannot refrain from quoting, at this time, Thayer's paraphrase of Osler's advice to his students: "Observe, record, tabulate, communicate. Use your five senses. The art of the practice of medicine is to be learned only by experience; it is not an inheritance; it cannot be revealed. Learn to see, learn to hear, learn to feel, learn to smell, and know that by practice alone you can become expert. Medicine is learned at the bedside and not in the classroom. See and reason and compare and control. But see first. No two eyes see the same thing. No two mirrors give forth the same image. Let the world be your slave and not your master. Live in the ward."

Observation of the patient may speak volumes. The experienced clinician has learned to catch at a single glance the essential conditions of his patient as he walks into the room and many of us younger men have forgotten some of these old fashioned signs. Have you ever walked into a room and noted the patient slumped in bed following abdominal operation? Have you ever observed that he did not turn his head to look at you when you came into the room? That patient is sick. The weak voice is indicative of the vitality of a patient, as well as a weak pulse. I know, of course, that we offend our nurses when we do not look over their charts and observe the fine records they have kept for us. These records are not nearly as important as the observation of the patient. The expression on his face, the tone of the voice, the position in bed, the appearance of the tongue, old fashioned signs though they may be, are of utmost value in evaluating the condition of a patient. At a single glance one may get the impression of a peritoneal disease. The knees may be drawn up, the tongue coated, and the basin close by for vomitus; the facies may present an expression of

anxiety, suffering, and a sense of impending disaster. It is difficult to describe this expression, but it can be recognized by the experienced. It is never absent in acute peritoneal conditions. If one does not see this, he should be exceedingly wary in diagnosing an acute condition within the abdomen even though other signs seem conclusive. At times I have offended my confreres by refusing to open an abdomen which was rigid and painful because the patient looked too comfortable. He was out of balance with the abdominal signs. These cases almost invariably turn out to involve referred symptoms from the chest or diaphragm. Physicians are all familiar with the flushed cheek, the slight increase of respiration, the slight cough heard occasionally during the conversation, which should immediately excite the suspicion of a chest lesion regardless of the abdominal signs.

Perhaps all these things and more are caught at one glance before the story of the disease is elicited. The story is so important. Murphy said that if it were told correctly, the diagnosis would stand out as though written in large letters. The fault often lies with the physician who is hurried or impatient with a loquacious patient or his relatives. It takes cross-examination at times to get at the truth, to separate the inconsequential form that which is relevant. It can and should be done. The ruptured ulcer should give a history of previous digestive disorders quite different from that of the acute gall-bladder with its usual story of flatulent indigestion. In cases in which the picture is either that of sub-acute perforation or acute cholecystic disease, the ratio of ulcer is 3 to 1 for men, whereas that of gallbladder disease is just the reverse, being 3 to 1 for women.

Carcinoma of the large bowel with obstruction or perforation would be suspected in an elderly patient with an acute abdominal crisis, whose history related blood in the stools and a disturbance of bowel habit. A history of functional disturbance of the pelvic organs must not be dismissed as irrelevant merely because the abdominal signs do not conform to the textbook pattern. Physicians miss more things from not thinking than from not knowing. It is almost a truism that, if a diagnosis does not ring true, something unthought of will be found at operation.

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Pain is probably the most constant and outstanding symptom of the acute abdomen. Pain is a clarion cry. It is nature's flashing signal that harm or injury is being done. It sends the mother, white-faced, to call the doctor when she hears the shrill cry of her sick child. A proper interpretation of pain alone may make a diagnosis certain.

It should be emphasized strongly that continued abdominal pain usually indicates a surgical condition. It must be asserted just as earnestly, however, that not all abdominal pain indicates abdominal disease. Those overflow pain impulses from the chest and diaphragm are not so severe. They disappear or are modified in a few hours. The corresponding signs and symptoms of acute abdominal disease are lacking or are not parallel. Tenderness is not commensurate with rigidity. The pulse rate is too slow. It does not have the quick, discourteous slap. The facies are more comfortable. This discrepancy and contradiction should be a warning, and observation should be practiced for a few hours. This can be carried too far in children. Late cases of appendicitis with local or spreading peritonitis usually show moisture in the lungs or other signs which blur the picture to one who is called to see the case late. The trajectory of the pain in coronary disease and angina pectoris is frequently to the gallbladder. Nausea, vomiting, and local spasm of the recti muscles sometimes occur. The old, old story of "acute indigestion!" The cue here, of course, is the accompanying substernal pain, the dyspnea, the tone of the heart, the history of circulatory derangements, the absence of digestive disturbances in the foreground.

Everyone is familiar with those overflow pain impulses from the ureter or kidney which may simulate the most violent abdominal disease. The condition is well illustrated by a patient who was brought to the hospital in the night with poignant, colicky pain, nausea, vomiting, and distention. To make the diagnosis plain, there was an appendix scar. Obstruction, of course! This man was fortunate in having a painstaking, thorough, meticulous analytic surgeon. Why should this pain be felt, even though slightly, in the testicle or over his hip? Abdominal pain is never referred here. A urinalysis disclosed a few red blood cells; cystoscopy, a horseshoe kidney and

a blocked right ureter. The point to be emphasized is that the cues are usually present. They are the red entries in the ledger. They may be upstage in the shadows. We miss them from not thinking, or we fail to be impressed because they seem to be so trivial compared with other signs. It cannot be emphasized too strongly that a single urologic cue should be given the greatest consideration even though the abdominal picture stands out in strong light. Recourse to cystoscope, the microscope, and roentgen ray is indicated and causes little delay.

Little need be said about the pain of ruptured ulcer. This is one disease, with its sudden agonizing, brutal attack, its rigid muscles, and its capacity to absorb morphine without relenting, that runs true to the textbook picture. Several things have impressed me. There are silent ulcers, the first sign of which is that of rupture. The history fails in these cases. Shock is not always marked, and the pulse is not always as rapid as one would suppose. The facies are never forgotten. The anxiety, the suffering, the sense of disaster and dissolution are all mirrored. When this picture is present, the diagnosis cannot be denied even though the history for ulcer is absent.

However, if this picture is so modified that all symptoms and signs are softened, if the knees are not drawn up, if the muscles are not hard enough, if the patient looks more comfortable than he should, that is, if his general appearance is disproportionate to the abdominal pain, caution is advised.

In acute abdominal disease with general pain and tenderness there is always one spot more tender than the rest, and it hurts when the patient moves in bed. This observation has been of inestimable value and bears repetition. In acute abdominal disease with general pain and tenderness there is always one spot more tender than the rest, and it hurts when the patient moves in bed. The ruptured ulcer is exquisitely tender over this area. You know that this is true of appendicitis, because the only constant sign is that of focal tenderness. There may be spreading or general peritonitis present, but the appendix region is still the most tender. It is deplorable that more attention is not given in the teaching of medical students to this point of focal tenderness in the diagnosis of appendicitis. Most of

our interns are looking for rigidity, leukocytosis, fever, and pain in the epigastrium, which moves down to the right side. Violent forms of the disease exist with some of the signs absent or so modified that only the experienced can interpret them correctly. But focal tenderness of the diseased organ is always present.

I recently saw a patient with mild upper abdominal distress, without definite pain, without definite digestive disturbances, but with a rapid pulse, chills, high fever, and facies suggesting peritoneal disease. The diaphragm on the right side was slightly fixed. Respiration was normal. Palpation of the gallbladder region showed marked tenderness, which was a great surprise to the patient. All the usual signs of an acute inflammatory gallbladder with stones were so softened and modified that they were in the background, except this one. The patient did not have the acute pain referred to the epigastrium and right shoulder, so typical of gallstones. But he did have focal soreness. Operation revealed empyema with stones. This same principle, if taken in conjunction with other pertinent data, can be applied to the diagnosis of pelvic lesions, whether they be twisted ovarian cyst, ruptured ectopic pregnancy, or inflammatory disease.

The pain of intestinal obstruction is striking. It is colicky and usually felt first in the upper abdomen. It comes and goes. The patient looks sick. There is nausea and later vomiting. Peristalsis is usually heard. And yet with this characteristic and usually unvarying picture, it is often missed. If you do not think that this is so, recall to mind the late and hopeless cases operated upon in your hospitals. Why should this be so? Some still forget that gas or feces will be passed from below the obstruction. Some still fail to look at the hernial orifices, or for abdominal scars. Some still wait for fecal vomiting and terrifying distention. It is a disgrace for any of our profession to wait for these premortal changes. Operation at this time is hopeless and only gives occasion for the usual headlines in the next day's paper, "Patient Dies of Operation." It should read, "Patient Dies of Delay." There is no disease that has a narrower threshold of safety. There is no disease that needs more prompt action. It takes courage in the postoperative cases to tell the sick and discouraged patient

and his anxious and often unfriendly and doubtful relatives that another operation is necessary. Delay in the presence of these faithful symptoms only makes matters worse, whereas prompt and courageous action will save most of these unfortunate patients.

I desire to mention one other condition which has been receiving increased attention during the last few years. I can illustrate this by briefly reciting a case. A young man, about twenty-six, presented himself with pain in the right lower quadrant. This had been somewhat chronic in nature, coming and going, but recently had become acute. There was slight fever, mild indigestion, some loss of weight and constipation. The leukocytes were about 15,000 with 80 per cent polymorphonuclears. Examination revealed a great deal of soreness in the appendix region and a suspicion of a mass. It was thought that this was a case of appendiceal abscess. At operation, the terminal ileum was found to be enlarged, thickened, purplish-red in color and somewhat edematous, for a distance of fourteen inches. The appendix looked somewhat the same and the tip of it was attached to this thickened ileum and was canalized with it. This being my first introduction to terminal ileitis, I did not recognize it and felt that because the appendix had canalized itself to the ileum, the latter organ presented the picture which it did. The appendix was removed and the patient made an uneventful recovery, gained weight and had a good appetite.

A few months later, he was seized with a sudden, violent, acute pain in this right side, high fever, nausea and vomiting. X-ray study revealed the typical findings of terminal or regional ileitis. To show how frail human knowledge and judgment may be, I will tell you that because he seemed a little better, and because the holiday season was approaching, I felt that we could postpone the necessary resection of this portion of the bowel until after the holidays. Within twenty-four hours he presented himself with signs of a ruptured bowel in this region. Operation was immediately performed and the same intensely swollen, edematous ileum was found. In spite of the local peritonitis which was present, radical resection was done and the Mikulicz technic employed by bringing the two ends of the bowel out together. After a stormy convalescence, he recovered and later a repair was

made of the bowel. He has remained perfectly well to date.

The original description of this lesion was by Crohn, in 1932, who described it as a granulomatous, ulcerated, stenosing inflammation of the small intestine. The characteristic feeling of the region took me back to my boyhood days when I used to handle and catch snakes. The bowel was thickened, slightly flexible and gave one also the impression of a flexible lead-pipe.

No effort has been made to cover all the acute conditions that may happen within the abdomen. Emphasis has been placed only upon certain factors of diagnosis and those conditions which were mentioned have only served to illustrate the application of these principles.

These foregoing principles are elementary but certainly fundamental. It should be remembered that disease of any system or organ results in a disturbance of function of that organ. The signs and symptoms are always present to some degree. Confusion and mistakes occur by reason of

our own inattention and prejudices. It is helpful to remember that after the age of forty, practically no new abdominal diseases exist except neoplasm and inflammations, all other being complications of pre-existing conditions. It is pertinent to remember, as DaCosta said, that an absent sign should be given grave consideration. Finally, it is invaluable to remember the tendencies, the conventionalism if you please, the relation of acute disease to age and sex.

If all available data, for and against, were put down in parallel columns, as in a ledger, and a balance struck off, the diagnosis would rarely be wrong.

At times I admire a snap diagnosis, because I have learned that it is not snap at all but represents the epitome of experience acquired by virtue of eyes that see, ears that hear, delicate fingers that touch, and a mind that correlates. Not all the tragedy is in the abdomen of the patient. There will be less in our own hearts as we become better clinicians.

AGRANULOCYTOSIS FOLLOWING THE PROLONGED USE OF ALLONAL*

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IN 1922, Werner Schultz¹⁸ described a highly fatal syndrome which he regarded as a new and distinct clinical entity and for which he proposed the term "agranulocytosis." It occurred mostly in elderly women and was characterized by necrotizing lesions in the mouth, pharynx, rectum and vagina, and was associated with fever, marked prostration and a profound leukopenia with complete or near complete absence of the granulocytes in the circulating blood, but with little if any anemia or reduction in the blood platelets. Subsequent terminology used by various writers include agranulocytic angina,⁸ idiopathic neutropenia,¹ malignant neutropenia² and primary granulocytopenia.

Since then much discussion has arisen as to whether or not it really constitutes a new or a distinct clinical entity.^{3,7,10}

Surveys of the medical literature by numerous

writers, among whom especially to be mentioned are Thomas Fitz-Hugh, Jr.,⁶ and Kracke and Parker,¹¹ indicate that prior to his original description there are possibly only three reports of cases which at the present time would be classified as agranulocytosis: One by Brown, in 1902, entitled, "A Fatal Case of Acute Primary Pharyngitis with Extreme Leukopenia"; one by Schwartz in 1904, "A Case of Extreme Leukopenia," one by Tuerck in 1907, "Septic Disease with Atrophy of the Entire Granulocytic System." According to Fitz-Hugh,⁶ Brown believed that his case was identical with those of plegmon of the pharynx reported by Senator in 1888.

Leichtenstein, cited by Küpper,¹² reviewed all cases since 1916, in the Stockholm Hospital, for epidemic diseases "recorded as septic angina, acute leukemia and diphtheria and found prior to 1926 only five cases (of which three were doubtful) which could be possibly called agranulocytosis, and after 1926 twenty-six cases all of

*Read before the Minnesota Academy of Medicine, December 9, 1936.

which were unmistakable." In the same paper he collected 327 cases from forty-three different observers and found that it occurred three times more frequently in the female sex than in the male, that the age incidence was between 30 and 60 years and that the mortality rate in 227 cases was 75 per cent.

Kracke and Parker¹¹ gave an excellent and comprehensive review of the literature and stated that "it was responsible for more than 1,500 deaths in the United States alone in the three-year period ending in 1934."

The salient features¹² in the etiological approach may be briefly summarized as follows:

Lovett, who reported the first case in the United States, attempted to prove a bacterial cause for the disease, but this was disproved when Kracke demonstrated that the leukopenia preceded the septic manifestations.

Miller and Rhodes produced ulcerative stomatitis with leukopenia in dogs on a vitamin G deficiency diet and Britton and Corey observed leukopenia in adrenalectomized cats.

Thompson's report of eighteen young women, whose agranulocytic attacks coincided with their menstrual cycle, suggested the possibility of an endocrine dysfunction. However, Wingate Johnston reported a case occurring in a physician's wife during her menses who completely recovered on discontinuing the use of amidopyrine, which was taken only at that time.

In 1935, Stephens and Lawrence²⁰ reported a case of cyclical agranulocytic angina in which, for two years, the patient "presented the unusual picture of recurrences of granulocytopenia with each menstrual period." They go on to say: "Following bilateral oophorectomy there was slight change in the picture during a period of one year, after which time no further recurrences occurred. Amidopyrine was taken at times by this patient, but our dates do not allow any positive statement as to any causal relationship between it and the cycles of granulopenia."

For many years certain chemicals and physical agents have been known to have a decided depressant effect upon the bone marrow, namely—radium paint, x-rays, arsphenamine, gold salts, bismuth, dinitrophenol and amidopyrine.

Selling,^{9,19} in 1910, was the first observer to call attention to the markedly depressant effect of benzene on the hematopoietic system. He re-

ported three cases of purpura hemorrhagica due to benzol poisoning. In 1916 he stated, "Benzol is a powerful leukotoxin. It destroys the white cells of the circulating blood and the parenchymal cells of the hematopoietic organs. Myeloid tissue is injured more than lymphoid tissue and, corresponding to this, the polymorphonuclear leukocytes of the circulating blood are more affected than the lymphocytes. The erythroblastic tissue of the bone marrow is destroyed but the circulating erythrocytes are injured relatively little."

Kracke's¹¹ report, in 1931, of a case of acute fulminant agranulocytosis following large doses of phenacetin gave the first intimation of the possibility of a drug relationship.

In 1933, Videbech¹² in Denmark, and in 1934, Madison and Squier¹⁴ in America were the first to incriminate amidopyrine. The latter's fourteen cases all gave a history of amidopyrine medication prior to the onset of the disease. They also gave amidopyrine to two recovered cases with a resultant relapse in each instance, while a like trial on a normal individual had no effect.

Since then, according to Kracke,¹² 172 cases have been reported following the administration of drugs: 153 following amidopyrine, six dinitrophenol, four neostoban and the remaining, a group of various drugs.

Squier and Madison¹⁵ recently tabulated 263 cases taken from thirty-three authors and found that in 163 the granulocytopenia was preceded by amidopyrine alone or in combination and in thirty-nine by other drugs bringing the total number to 202 cases in which a drug etiology was probable.

In view of the enormous amount of amidopyrine generally used without obvious ill effect, Pepper⁵ suggested a sensitivity reaction on the part of the individual to explain its occasional toxic action on the bone marrow.

Rawls¹⁶ recently studied the effect of amidopyrine upon the red, white and polymorphonuclear blood cells in a series of 100 patients suffering from arthritis. Over 100,000 tablets of amidopyrine were administered to 400 patients and of these four developed agranulocytosis with three deaths (1 per cent). He came to the conclusion that amidopyrine does not produce hematologic changes except in certain isolated cases where there is probably an idiosyn-

crazy to the drug. He stated that it should not be given to elderly people or to those with a long standing infection.

Fitz-Hugh and Krumbhaar,⁷ in 1932, reported the pathological changes found in the bone marrow in three fatal cases of agranulocytosis and stated that the marrow of the bones examined in one case contained active hematopoietic areas filled with myelocytes, promyelocytes and myeloblasts while the peripheral blood contained only 200 w. b. c. per cu. mm. In the two other cases there was likewise absence of myeloid aplasia. They suggested a condition of a myelocytic maturation arrest as an explanation for the paucity of the circulating granulocytes.

Henry Jackson, Jr.,¹⁰ in a recent article agrees with this viewpoint and in addition to twenty-seven of his own cases coming to autopsy cites eleven cases analyzed by Custer in which "there was marked proliferation of the myeloblasts with failure of these cells to mature, while the other elements of the bone marrow were undisturbed."

Leukopenia and granulopenia are frequent accompaniments of many disease states, such as the leukopenic phase of an acute leukemia, pernicious anemia, aplastic anemia and certain infectious diseases, such as typhoid and typhus fever, influenza and measles.

In the infectious diseases the clinical features are usually distinctive and serve to make diagnosis possible. However, confusion in differential diagnosis may arise in certain types of blood dyscrasias unless one recognizes that neither marked anemia or thrombopenia are features of the disease. If one permits a severe anemia or hemorrhages in the skin to enter into the clinical picture, the diagnosis of agranulocytosis becomes hopelessly confused with other types of bone marrow insufficiency and especially with the acute phase of aleukemic leukemia in which symptoms in every other respect may be identical.

The present concept¹⁷ of agranulocytosis holds that it is due to a depressed condition of the bone marrow in which a selective failure of the myelocytic function occurs, causing a complete or a near complete disappearance of the granulocytes in the blood stream with clinically unimportant involvement of the circulating erythrocytes and thrombocytes.

When this condition is diffuse,⁴ all the formative elements of the bone marrow are involved, resulting in anemia, thrombopenia, leukopenia

and granulopenia, as illustrated in aplastic anemia.

The granulocytes⁴ protect the body against bacterial invasion and with their disappearance active immunity is lost and local bacterial invasion takes place in the form of necrotic lesions in the mouth, pharynx and rectum. General septic invasion results unless timely granulocytic recovery takes place. However, general sepsis may be so abrupt as to preclude the possibility of timely granulocytic response, thus resulting in the acute fulminant type and an invariably fatal outcome.

The purpose of this paper is to report three cases of agranulocytosis following the long continued use of allonal occurring in patients who had been under observation and care for several years.

Case Reports

Case 1.—Mrs. E. McP., aged sixty-four, widow, weight 176 pounds, was under observation from 1926 to 1929. During this period her chief complaints were cough, epigastric and precordial discomfort, associated with easy exhaustion, nervousness and insomnia.

Physical examination, including x-rays of chest and gastrointestinal tract, electrocardiogram, blood and urine was negative. During 1927, 1928 and 1929, veronal, allonal and amylal compound were frequently used for insomnia. The exact amount is unknown.

The earliest symptoms of the disease which eventually led to a fatal termination manifested themselves during the Christmas week of 1928, when she said that she was confined to her bed on account of the "flu," with severe cough and fever. Following this she became easily tired and perspired upon the least exertion.

On March 4, 1929, she had a severe attack of vomiting and stated that one week previously she had first noticed a swelling and pain in the left side of her neck.

On admission to the hospital on March 23, 1929, there was a tender lemon-sized hard mass in the left side of her neck posterior to the sterno-mastoid muscle. The white cell count was 4,000. No differential count was made. The abscess was drained on the eleventh day and at the end of two weeks she left the hospital improved.

During this time she took two allonal tablets every night. On April 27, 1929, one of the right upper molars was removed. Swelling of the parts and soreness in the back of the throat, roof of the mouth and gums followed, accompanied by pain and difficulty in swallowing.

On April 30, 1929, she was readmitted to the hospital. At this time there was a rather deep ulceration 1.5 centimeters in diameter with a sharp clean-cut edge adjacent to the site of the extraction and a small necrotic area in the roof of the mouth. The extraction

site was deep and gangrenous. The base of the ulcer was covered with a thick adherent greenish-gray tenacious exudate.

The gum was reddened, spongy and a grayish exudate

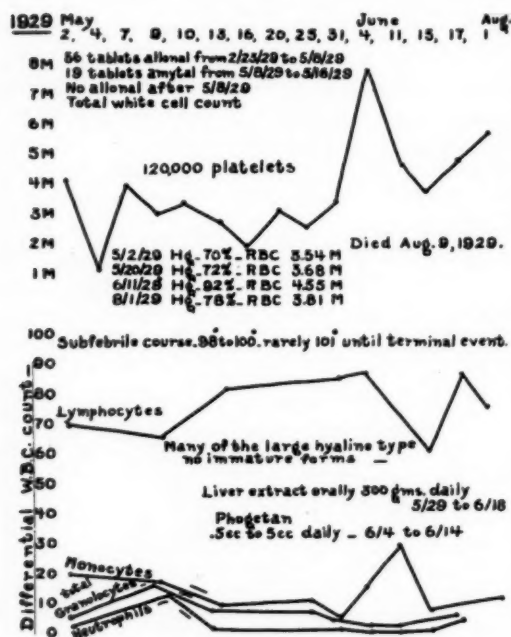


Fig. 1. Mrs. McP.: age sixty-four years. Chronic agranulocytosis terminating in an acute fulminant attack. Course during two months: White blood cell counts with percentages of lymphocytes and monocytes. Hemoglobin, erythrocytes and treatment employed.

was adherent to the gingival margin on the right side of the mouth. Tonsils were swollen and injected. The exudate from the ulcer in the mouth showed many fusiform bacilli and spirals, Vincent's organisms and nonhemolytic streptococci. Temperature on admission was 99.6°. This varied from 100° to 102° during the course of the disease.

The accompanying chart (Fig. 1) covers a period of three months and shows the blood counts made, the amount of allonal and medication used and the treatment employed in an effort to stimulate granulopoiesis.

It will be noted that on admission the blood showed a Hg. of 77 per cent; red blood cells, 3,540,000; leukocytes, 4,300; polymorphonuclears, 4 per cent; lymphocytes, 70 per cent; monocytes, 21 per cent; basophils, 3 per cent; plasma cells, 2 per cent. The morphology was that of a slight secondary anemia and no immature cells such as found in leukemia were present.

The subsequent course shows a fairly constant level of erythrocytes and hemoglobin percentages. The platelets numbered 120,000. The total white count fluctuated from 1,300 to 8,100 with but little change in the abnormal lymphocytic-granulocytic relationship. Even

with a total white count of 8,100 which followed the intramuscular injections of phlogetan, a vegetable protein, 88 per cent were lymphocytes; 2.5 per cent neutrophils; 5.5 per cent monocytes; 3.5 per cent basophils, and 2.5 per cent eosinophils, showing a relative and absolute increase in the lymphocytes but no granulocytic response.

Likewise, no effect was obtained by the oral administration of liver extract or small doses of neosalvarsan.

After a month's period of apparent well being, she had a sudden onset of exquisite pain on August 5, 1929, involving the posterior right thoracic and axillary region accompanied with small moist râles at the bases of the lungs, marked prostration and repeated vomiting. Her course ran rapidly downwards and she died on the third day after the acute onset.

Her blood picture two days before the onset of the fatal episode was as follows: Hemoglobin, 78 per cent; erythrocytes, 3,810,000; leukocytes, 5,800; differential count: polymorphonuclears, 6 per cent; lymphocytes, 77.5 per cent; monocytes, 6.5 per cent; eosinophils, 7.5 per cent; basophils, 2.5 per cent.

Clinical diagnosis.—Chronic agranulocytosis terminating in an acute fulminant attack and following the long continued use of allonal.

Necropsy findings.—The body was that of a well-developed, well nourished, adult, white female, 164 cm. in length and 150 pounds in estimated weight. Rigor mortis was absent. Deep hypostasis was present on the dependent parts, particularly on the posterior aspects of the thorax. A healed wound, well surrounded by a zone of purplish discoloration, well encrusted, was observed on the dorsal aspect of the right arm. No edema, jaundice, or cyanosis was noted. The skin was somewhat sallow.

The subcutaneous adipose tissue was abundant.

The peritoneal cavity contained no excess fluid.

The appendix hung free. The colon was enormously dilated. The liver was behind the costal margin. The height of the diaphragm was at the fourth intercostal space on the right and the fifth rib on the left side.

The pleural cavities showed no adhesions or fluid. The parietal pleura on the right side was more reddened than that of the left.

The pericardial cavity contained about 10 c.c. of clear, amber fluid. The pericardium was normal.

The heart weighed 425 grams. The epicardium was smooth. The myocardium showed a slight thickening of the left ventricle, was pale red and somewhat soft in consistence. The mural endocardium was smooth. The valves showed no disease. The coronary arteries showed a slight degree of atheromatous changes, but the lumina were patent throughout. The root of the aorta showed a smooth intimal surface, and a normal thickness of the wall.

The left lung weighed 400 grams. Crepitation was preserved throughout except the dependent portions, which were dark red in color, partly atelectatic, and showed a small amount of bloody fluid on cut surfaces. No pus was demonstrated. The right lung weighed

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450 grams. Crepitation was present throughout the upper and middle lobes. The lower lobe was dark red in color, atelectatic, and showed an area of blackish-red discoloration about 6 cm. in diameter along the periphery

of the terminal ileum and in a few areas of the colon, but no ulceration was noted.

The pancreas was normal.

The adrenal glands were normal.

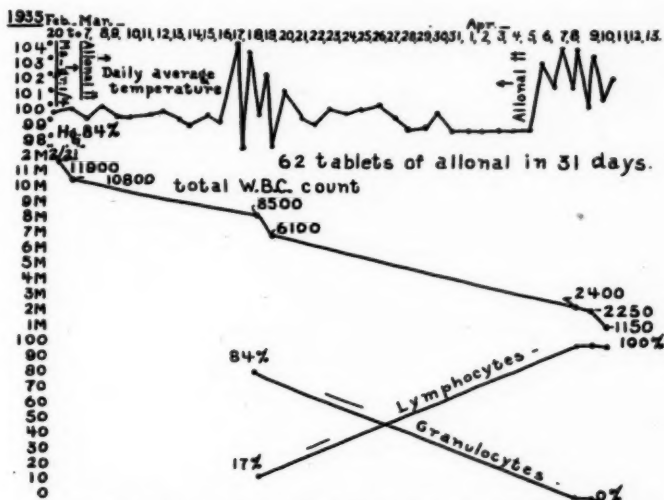


Fig. 2. Mr. W. C. K.: age sixty-three years. Acute fulminant agranulocytosis occurring while under treatment for a different ailment. Daily average temperature readings. Amount of allonal used. White blood counts with percentages of granulocytes and lymphocytes made during two months observation in hospital.

in the axillary line and near the base, which was solid on palpation, somewhat raised over the pleural surface, and, on section, showed a dry, red surface with a fading margin. The vessels leading into this area were occluded. No pus could be expressed.

The spleen weighed 255 grams. The capsule was smooth and tense, and the surface was dark and mottled and somewhat lumpy. The cut surface was dark red and showed the pulp dark red and soft. The corpuscles and trabeculi were fairly visible.

The liver weighed 1,700 grams. The capsule was smooth but somewhat mottled, bluish-gray in appearance. The cut surface showed extensive hemorrhages in the centers of the lobules, and yellowish, cloudy parenchyma. The liver was somewhat cloudy and soft in consistence.

The gallbladder was greatly distended and enlarged to the size of a pear. The serosa was dull and edematous. The wall was somewhat fibrous. It contained a dark mucoid bile and a rough, round calculus 1 cm. in diameter.

The esophagus was distended to a diameter of 2 cm. The wall was thickened and edematous. A few small islands of swollen mucosa were noted within a diffuse area of superficial ulceration which showed a dark purplish discoloration of the base throughout. The distal three centimeters showed no ulceration. The stomach showed no ulcer. Its mucosa was congested. Edema and congestion were noted along the mucosa

The right kidney weighed 165 grams and the left 145. The capsules stripped readily, leaving smooth surfaces. The cut surfaces were cloudy, and showed the cortices somewhat narrowed. The pelvis were slightly dilated and the pelvic mucosa edematous and injected.

The ureters and the urinary bladder were essentially normal. The latter was distended.

The uterus and adnexa were small and atrophic.

Lymph nodes were not prominent.

The aorta showed a moderate degree of atherosclerosis in the abdominal portion.

The neck and head were not examined.

The bone marrow of the right femur showed a reddened, meaty, marrow tissue in excess amount.

Diagnosis (Kano Ikeda, M.D.):

1. Agranulocytic angina (clinical).
2. Gangrenous esophagitis.
3. Septic infarct of the lower lobe of the right lung.
4. Cloudy swelling of the liver, spleen, kidneys, and heart.
5. Hyperplasia of the bone marrow.
6. Chronic cholecystitis with cholelithiasis.

Baldrige and Needles, in 1931, stated: "Many authors do not accept as agranulocytosis any case in which there is a significant absolute increase in lymphocytes or monocytes." However, they considered this to be of doubtful value.

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This proven case of agranulocytosis shows an unusually sustained high level of total white blood cells caused by an absolute increase in

night sweats, marked exhaustion and by the daily recurrence of severe epigastric pain beginning about eight o'clock P. M. The pain was not influenced by rest, diet, belladonna, alkalies or codeine, but was controlled

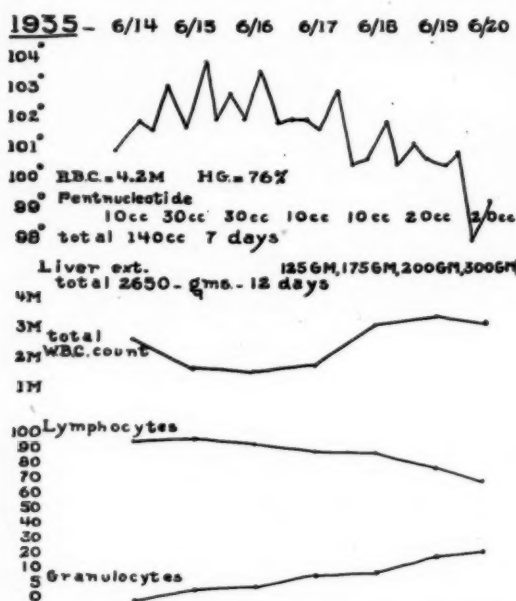


Fig. 3. Mrs. C. L. H.: age sixty-five years. Agranulocytosis. Course during first week: Daily total white blood cell counts with percentages of granulocytes and lymphocytes, temperature range and treatment employed. Hemoglobin and erythrocytes on admission.

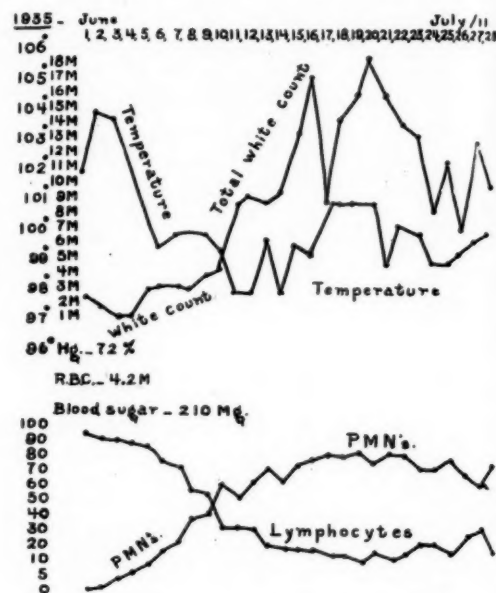


Fig. 4. Mrs. C. L. H.: Course during first twenty-eight days. Daily white blood cell counts with percentages of granulocytes and lymphocytes. Maximum temperature readings.

lymphocytes and monocytes and, therefore, suggests the necessity for routine differential white blood cell counts if diagnostic errors are to be avoided.

Case 2.—Mr. W. C. K., aged sixty-five years, salesman, widower, had been observed intermittently over a period of seventeen years with symptoms suggestive of duodenal ulcer but with negative x-ray findings.

On the evening of February 17, 1935, after five years of comparative good health, while he was bending forward and applauding the players in a hockey game, he was suddenly seized with a violent pain in his right groin, radiating upwards to the right costal margin. During the night it localized in the epigastrium, was constant and prevented sleep. He repeatedly attempted to vomit. He was seen early the following morning, at which time he complained bitterly of epigastric pain. His entire abdomen was soft, without localized tenderness or distention. Morphine gave him almost immediate relief and this relief was maintained during the next two days, only to have it recur on the third day.

His general appearance was now that of a very sick man. His face was pale, his skin moist and clammy but his abdomen was still soft and without tenderness or distention. An electrocardiogram was negative. His course in the hospital was characterized by profuse

by the daily administration of morphine. Morphine was continued for fifteen days and then stopped when two tablets of allonal were found to give complete relief.

The exact cause of his complaint remained obscure as no definite objective findings were present. An x-ray gastro-intestinal study showed no intrinsic lesion in the stomach proper or duodenal cap but a large and unusual curve of the duodenum suggested a pancreatic lesion.

Two tablets of allonal were given every night from March 7 to April 6, making a total of sixty-two tablets in thirty-one days.

The chart (Fig. 2) gives his daily maximum temperature range, total white blood cell and differential count. During his first two weeks in the hospital his maximum temperature range was about 100° and his w. b. c. 11,900 and 10,800—with a hemoglobin of 84 per cent. No differential count was made. No change occurred in his temperature until March 17, when it suddenly reached 104.6°, gradually returning to his usual range after five days. On March 17, at the maximum temperature reading the total w. b. c. were 8,500, with 84 per cent granulocytes and 16 per cent lymphocytes. On the next day it was 6,100.

On April 5 he complained of severe sore throat. On the next day his temperature rose to 103.4° and his right submaxillary lymph glands were enlarged.

AGRANULOCYTOSIS FOLLOWING USE OF ALLONAL—HOFF

He ran a rapid septic course with marked enlargement of his submaxillary lymph glands and died on April 10, 1935, the fifth day after the clinical onset.

He showed a complete granulopenia on April 8, 9,

She is also decidedly sensitive to ragweed pollen, suffering with seasonal hay fever and asthma.

Insomnia had not been an outstanding feature, although troublesome at times. To relieve this difficulty allonal was prescribed three years ago. Since that time, she has averaged 12 allonal tablets monthly. The course of the disease is shown in the accompanying charts (Figs. 3, 4, 5). These record daily white blood cell and differential counts and temperature for a period of forty-one days. Thereafter the counts are as indicated for a subsequent period of eight months. It will be noted that on admission June 14, 1935, her temperature was 101; red blood cells, 4,200,000; hemoglobin, 76 per cent; white blood cells, 2,750; lymphocytes, 99 per cent, and one degenerated granulocyte. Subsequent daily counts are shown and their return to a normal total and qualitative count paralleled the pentnucleotide and liver therapy.

The pentnucleotide was discontinued on the eighth day, after a total of 140 c.c. had been given. Daily injections of liver extract to the equivalent of 2,650 grams of liver were given over a period of twelve days, and then discontinued for about one month. In addition one ounce of raw fresh bone marrow was given three times daily. On the tenth day she began to complain of soreness in her left buttock and a firm tender egg sized mass was palpable in the deep subcutaneous tissues. As this gradually increased in size, the white blood cell count reacted strongly and reached a level of 17,500 per cu. mm. with 80 per cent granulocytes and 20 per cent lymphocytes. The abscess was drained on July 18, twenty-six days after its onset, resulting in a return to a normal temperature and a subsequent fluctuating white blood cell count and an interlocking differential one. The subsequent white counts have been made at intervals of two to three weeks up to September 1, 1935.

It will be noted that the total white cell counts have remained at a very satisfactory level but that the granulocytes have shown a tendency to a reduction in their normal qualitative relationship.

The monocytes and eosinophils varied between 1 and 3 per cent; the monocytes during convalescence rarely exceeded 7 per cent. Erythrocytic values maintained a constant level at about 4,500,000. The first two months after leaving the hospital she received the equivalent of 100 gms. of liver extract intramuscularly three times weekly and thereafter 100 gms. at intervals of three weeks to two months. These dates correspond with those of the white cell counts.

During the acute stage of her illness a mild glycosuria was present with a blood sugar of 210 mg. per 100 c.c. of blood.

For a short period of time, she was on a high nucleoprotein diet, cod liver oil and Brewer's yeast tablets and now on February 1, 1937, after a period of nearly two years, she has remained perfectly well. Her total white and differential counts are within normal limits at the present time.

No amidopyrine-containing drugs have been used since the onset of her illness.

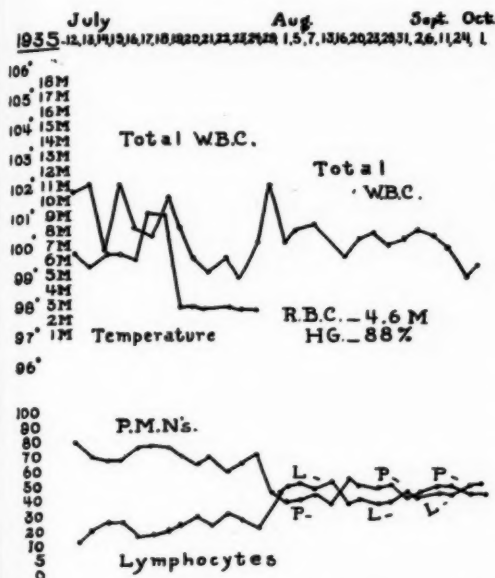


Fig. 5. Mrs. C. L. H.: Course during subsequent three months.

and 10, with total leukocytes of 2,400, 2,250 and finally 1,150. No immature cells were found.

The final event was not influenced by the pentnucleotide therapy attempted.

This is a case of acute fulminant agranulocytosis, occurring during the period of hospitalization for a different ailment and following the daily use of two tablets of allonal for thirty-one days.

Case 3.—Mrs. C. L. H., housewife, sixty-six years old, entered the hospital on June 14, 1935, on account of sore throat, general body aches and a temperature of 101°. These symptoms began six days previously. She complained bitterly of her throat, the degree of soreness seemingly out of proportion to the objective findings. In February, 1935, she had a similar attack and was confined to bed for two weeks. At this time she developed a small necrotic area on the left margin of her tongue and a moderate gingivitis. She was not hospitalized. She made a good recovery and remained well until the onset of her present complaint. During the past ten years she has been a mild hypertensive and a diabetic not requiring the use of insulin. At rare intervals over a period of many years, paroxysmal attacks of precordial pain, radiating into the neck and left arm, have occurred. These were relieved by rest.

NEWER DEVELOPMENTS IN ANESTHESIA—TUOHY

Diagnosis.—Agranulocytosis, recurrent type, with recovery.

Comment

Allonal, according to its manufacturers, is allyl isopropylbarbituric acid chemically fused with amidopyrine in the proportion of 1:1 $\frac{2}{3}$.

It enjoys considerable popularity as a pain relieving and sleep inducing drug both among physicians and the laity and in consequence is extensively used.

Ordinarily it may be administered with unquestioned safety. I had one patient who took two, sometimes three, tablets every night for four years without demonstrable injury. But the accumulated evidence against amidopyrine-containing drugs is such as to warrant the statement that its prolonged ordinary use in the occasional sensitized individual may result in agranulocytosis and death. There is no exact method for accurately determining such sensitivity and as a result where its use is unduly prolonged it becomes necessary to check up such patients with frequent total and differential white blood cell counts for evidence of leukopenia and granulopenia and also to exert our best efforts to prevent its indiscriminate use among the laity.

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NEWER DEVELOPMENTS IN ANESTHESIA*

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VARIOUS local and general anesthetic agents are submitted to the medical profession each year for the purpose of improving surgical procedures and alleviating pain. Whereas certain methods and agents have been proved by experience and time to be efficient and safe, it is only through the introduction of newer ones that progress can be made in order to obtain the optimal results. It takes years of trial to prove the merit of any anesthetic agent and consequently comparatively few of them endure. In the realm of general anesthesia, ether, nitrous oxide, and chloroform are still the most popular,

while procaine hydrochloride and cocaine hydrochloride as local anesthetic agents are predominantly used.

With the advent of newer types of gas machines for administering anesthetics, the carbon dioxide absorption technic has greatly reduced the cost of anesthesia to patients, because it is no longer necessary to use a continuous flow of gases. By means of rebreathing, the exhaled gases are passed through soda lime to remove the excess carbon dioxide, and then returned to the patient to be reinhaled. Thus, it is necessary only to use additional gas intermittently because some is lost through leakage about the face mask and connections with the gas machine. Oxygen

*From the Section on Anesthesia, The Mayo Clinic, Rochester, Minnesota. Read before the meeting of the Northern Minnesota Medical Association, Fergus Falls, Minnesota, August 31 to September 1, 1936.

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is the only gas which is supplied continuously to maintain basal metabolic processes.

This method of rebreathing and carbon dioxide absorption has made possible the use of the relatively expensive gaseous anesthetic, cyclopropane, introduced six years ago by Henderson and Lucas, and developed clinically by Waters and Schmidt. This agent is inflammable like ethylene, but produces more rapid anesthesia with less excitement and it may be used with higher concentrations of oxygen. This is a decided advantage when patients have a secondary anemia. The relaxation obtained with cyclopropane approaches that produced with ether. Recovery from anesthesia is rapid and the incidence of postoperative nausea and vomiting is minimal.

In all methods of general anesthesia, no matter what the agent used may be, the intratracheal tube of soft rubber is a decided aid when there is evidence of obstruction in the air passages, or when serious respiratory collapse occurs. The tube may be introduced orally or through either nostril, depending on the individual case, and the free end may be connected directly by means of special adapters to a gas machine or a face mask may be placed over it.¹² This method is of further advantage in certain operations on the head and neck in which it is desirable to have the anesthetist out of the operative field, and in high abdominal or diaphragmatic operations where it permits quiet, easy respiration. In operations on the brain the intracranial pressure is reduced when the intratracheal method of anesthesia is used.

Divinyl Ether ($\text{CH}_2\text{CHOCHCH}_2$)

Divinyl ether is a comparatively new anesthetic agent which is prepared under the trade name of "vinethene." It was predicted by Leake and his associates that this compound would possess an action resembling both diethyl ether and ethylene. It is very volatile and requires special apparatus for its administration by the closed method.

Jackson in experiments on dogs found that anesthesia produced by moderate concentration of the vapor of divinyl ether is somewhat lighter than that produced by diethyl ether. He also found with divinyl ether that there is evidence of more muscular twitching and slight convulsive movements than there is with ether. In this

respect he felt that the action of divinyl ether on dogs resembles that of ethyl chloride. Goldsmith and his associates have used divinyl ether rather extensively and have experienced satisfactory results in practically all types of operations. The drug is definitely more potent than ether is and the induction and recovery periods of anesthesia are rapid. As yet divinyl ether has not had adequate clinical trial to determine its efficiency and merit, but in the next year or so more extensive information should be available.

Trichlorethylene is an anesthetic of the unsaturated chlorinated hydrocarbon series. It is a solvent of fat and for years has been used for cleaning purposes, especially in dry cleaning work. The fact that trichlorethylene produces anesthesia and is noninflammable and nonexplosive is a definite advantage which most anesthetic agents do not possess. It is relatively less volatile than diethyl ether or ethyl chloride and must be administered with caution because a comparatively small amount will produce anesthesia. If one attempts to force or hurry anesthesia with trichlorethylene there is danger of serious respiratory paralysis. The degree of surgical relaxation is not as pronounced as it is with diethyl ether but recovery is more rapid. The administration of trichlorethylene has been advocated to relieve the pain of tic douloureux. The usual method of administration has been to place 25 to 30 drops of trichlorethylene on a gauze sponge or handkerchief and instruct the patient to inhale deeply until practically no odor remains. This procedure may be repeated three to four times a day depending on the nature of attacks. The relief of pain is probably attributable to the production of mild anesthesia and not to any specific or selective action of the drug on the fifth cranial nerve. In addition, trichlorethylene has been used in the same manner to alleviate the pain associated frequently with coronary disease. The relief mechanism, if the treatment is successful, is the same as that for trigeminal neuralgia. The reliability of trichlorethylene in either condition, however, is not constant but the agent may be used in the event other measures are not available or have failed.

Oxygen Therapy and Helium

A gas, relatively new in the field of anesthesia and therapeutics, is helium. Because of its low specific gravity (1.98) and atomic weight (4)

it was suggested by Barach that helium could be used with advantage in cases in which individuals were dyspneic. Less muscular effort would be required to move a mixture of oxygen and helium to and fro in the tracheobronchial tree than would be required to move one of nitrogen and oxygen. The reason for this is a physical one since a mixture of helium and oxygen is three times lighter than one of nitrogen and oxygen. Helium tanks may be attached to a gas machine and the agent may be administered like other gases. The nitrogen present in the respiratory circuit is gradually displaced by helium, and oxygen is added in whatever percentage is necessary. Any of the usual anesthetic gases may be administered along with the oxygen and helium if desired. The chief therapeutic uses for helium at present have been in cardiac diseases with decompensation and in asthmatic conditions. It is not unlikely that it will have greater applicability and usefulness in the future.

As a means of combating anoxemia, oxygen may be administered by a nasal catheter or with the more frequently used oxygen tent. The former method, however, is less expensive and in many instances will serve the same purpose as an oxygen tent. Wineland and Waters have studied the relative use of oxygen administered with the nasal catheter and concluded that adequate percentages of oxygen may be obtained in the bronchi by this method. A satisfactory method of administering oxygen by way of the nasal catheter is to place the tip of the catheter in the oropharynx, just back of the uvula. The distance from the end of the catheter to the exterior nares will usually correspond to the distance from the tragus of the ear to the nares. A flow of 6 to 8 liters of oxygen will usually maintain an oxygen percentage of 50 to 60 in the region of the glottis. If the flow of oxygen is too large, or if the nasal catheter is inserted too far, there is a tendency for the patient to swallow air.

Local Anesthetic Agents

Most local anesthetics are direct or substituted derivatives from one or several of the ring forms present in cocaine. For example, procaine hydrochloride is one of the most widely used of the cocaine derivatives. Metycaine, formerly known as "neothessin" or "pipercaïne," is likewise a

cocaine derivative of the piperidine series. In spite of all the various local anesthetic agents that are available for use now, practically all of them adhere to groups of known activity, and very few entirely new agents have been introduced. Procaine, or novocaine, is probably employed more frequently for local use than is any other agent, with the possible exception of cocaine. Years of experience have indicated that procaine is relatively one of the safest agents. A new local anesthetic which is being used for local anesthesia, and which has been investigated by Leffler and Adams, belongs to the oxazoline series and is closely related in activity to procaine. This agent, d-aminophenyl-oxazoline, is half as toxic as procaine, possesses the same pH as blood, and produces local anesthetic effects comparable to procaine in the proper concentration. As yet no clinical information is available, but this agent should have definite merit as a new local anesthetic.

Metycaine, which previously has been mentioned, is both a topical and local anesthetic which is slightly more toxic than is procaine when injected intravenously into animals. When used for regional anesthesia, such as spinal anesthesia, its toxicity is little, if any, greater than that of procaine and it produces longer anesthesia with comparable dosages than does procaine. The advantages claimed over procaine are, therefore, its applicability to the surfaces of mucous membrane and the longer anesthetic effect. In certain cases metycaine may be substituted for cocaine if necessary.

Methods of Regional and Local Anesthesia

Field block of the upper abdomen is a valuable procedure to use preliminary to a laparotomy under general inhalation anesthesia. It aids in reducing the amount of general anesthetic agent required, and is used in cases in which there is debility of rather marked degree. Blocking the sacral or cervical plexus is definitely reliable, when properly done. The former, sacral block, possesses all the advantages of spinal anesthesia for operations on the anus and perineum, and is accompanied by a minimum of untoward reactions. Operative procedures on the neck, such as laryngectomy, thyrotomy, and dissection of lymph nodes are frequently done by blocking the cervical plexus when it is not advisable to use a general anesthetic. In selected cases spinal anes-

thetia is used for abdominal operations below the diaphragm and for operations on the lower extremities. The general physical and mental status of the patient is the deciding factor in determining whether spinal anesthesia is the best choice of anesthetic procedure. Debility, which connotes marked loss of weight, definite anemia, and low blood pressure or cachexia, is the chief outstanding contraindication to spinal anesthesia. Furthermore, certain nervous and apprehensive individuals are not the best candidates for this form of regional anesthesia. When spinal anesthesia is the method of choice the dosage of the agent used is determined by the consideration of age, weight, height, blood pressure, hemoglobin, and type of operation. In cases in which procaine hydrochloride is used, not more than 1 mg. of the drug per pound of body weight is usually used.¹⁰ When other agents are used a similar equivalent ratio is calculated. In certain operations on the upper part of the abdomen, spinal anesthesia is intentionally combined with a general inhalation anesthetic. In these cases a small dose of spinal anesthetic is administered in order to minimize the amount of general anesthesia. As a rule the incidence of nausea or vomiting is increased in operations on the upper part of the abdomen under spinal anesthesia, and the direct combination of general anesthesia assists in preventing this. However, in not a few cases inhalation of oxygen and carbon dioxide alone will suffice to control the nausea.

Peridural Anesthesia

Pages, in 1921, and Dogliotti, in 1933, independently described a method of producing segmental or localized anesthesia by means of injecting a local anesthetic into the peridural space. This space lies between the ventral surface of the spines of the vertebra and the dura mater, and extends from the sacrum to the foramen magnum. It is filled with fine connective tissue, small blood vessels and fat, but its consistency still permits the easy diffusion of anesthetic substances.

The anesthetic agent injected into the peridural space acts on the spinal nerves extradurally, on the spinal ganglion and paravertebral sympathetic nerves. It is possible, therefore, with this method, to anesthetize certain limited areas or segments of the body. The technic of the injection is more delicate than that of sub-

arachnoid block, however, and requires more skill and care. The needle must be placed accurately in the midline of the intervertebral space and introduced just through the ligamentum flavum. This can be identified as the first definite resistance prior to contacting the dura. If no spinal fluid exudes and none can be aspirated with a syringe, the injection can be attempted. There should be no resistance encountered to injection when the needle is placed correctly in the peridural space. From 30 to 40 c.c. of a 2 per cent solution of procaine hydrochloride is the usual amount used and the injection should be made slowly. The site of injection may be any of the usual lumbar or lower dorsal interspaces. The duration of segmental peridural anesthesia generally is one to two hours. The chief advantages of this method, according to Dogliotti, are: (1) absence of danger of diffusion of the anesthetic toward the bulbar and cerebral centers, (2) a reduction of the anesthetized area to an immediate segment of the body, (3) a fall in blood pressure less than that caused by subarachnoid injection, (4) a rather constant absence of nausea and vomiting which in contrast occurs more frequently in spinal anesthesia, (5) the incidence of postoperative lumbar puncture headache is less than 1 per cent, and (6) in cases in which the patients are very weak and debilitated there is a greater margin of safety than there is with spinal subarachnoid block. The disadvantages observed with this method have been failure to obtain adequate anesthesia in the proper region as a result of lack of proper technic or improper diffusion of the anesthetic solution. Furthermore, there is a delay in obtaining anesthesia which is not present in most subarachnoid injections. Peridural anesthesia is not, therefore, recommended as a substitute for spinal anesthesia but as an added procedure which is useful in certain selected cases.

Intravenous Anesthesia

The short acting soluble barbiturates, such as pentothal sodium and evipal soluble, are useful agents for producing anesthesia for short operative procedures. In contrast to the intravenous administration of other barbiturates, such as pentobarbital sodium and sodium amylal, pentothal sodium and evipal soluble both have rapid induction and recovery periods, produce fair surgical relaxation and a minimum of post-

operative restlessness. However, the control of certain agitated psychoses, convulsive or manic states is more satisfactorily accomplished by the intravenous administration of pentobarbital sodium or sodium amytal than it is by the intravenous administration of pentothal sodium or evipal soluble because the duration of the effect of the former is longer than that of the latter.

The details of the administration of pentothal sodium have been described elsewhere,⁸ but in general it may be said that either pentothal sodium or evipal soluble, or any short acting barbiturate, should be administered intermittently, slowly, and not according to body weight. In this respect the intravenous administration of soluble barbiturates resembles closely that of administering ether by the drop method.

Children who are less than twelve years of age for the most part do not tolerate the intravenous administration of barbiturates well because of respiratory depression. Likewise, certain adults who have dyspneic conditions such as asthma or congestive heart disease do not react favorably to intravenous anesthesia. It is absolutely essential that a free airway be maintained in any case in which intravenous anesthesia is administered and it is wise to have a competent person hold the patient's jaw forward so that the tongue cannot fall back into the pharynx and interfere with the exchange of air. In the event that respiratory depression occurs, oxygen and carbon dioxide should be available and administered in the usual manner. Occasionally, it may be necessary to introduce a Magill intratracheal tube in order to maintain an adequate airway in the event that there is marked interference with respiration. The usual methods of nasal or oral intubation are used.

Analeptic Drugs

Under certain circumstances, such as resuscitation of the newborn, and in other conditions of respiratory depression, drugs which stimulate the respiratory center may be used. Most analeptics or restorative agents, according to Wright, have either a peripheral action on the sino-aortic nerve endings, or a central effect on the respiratory center itself. In most instances the agent used has both a peripheral and central effect.

For example, alphalobeline and nicotine in small doses act peripherally and the central ac-

tion of these agents is manifested only when large or toxic doses are used. Coramine administered in small doses will stimulate respiration reflexly but if larger doses are given they act centrally. If coramine is given in too large an amount, convulsions will be produced. It is true that small doses of almost all respiratory stimulants stimulate breathing and large doses tend to produce convulsions. Some of the more commonly used analeptics are coramine, picrotoxin, metrazol, carbogen, icoral, strychnine, caffeine sodium benzoate, and ephedrine. According to Wood, the denarcotization or restorative action of these various agents is probably not the result of a chemical neutralization of the agent producing narcosis or respiratory depression, but is attributable to the increased ventilation or improved circulation. When an intravenous anesthetic with soluble barbiturates, such as pentothal sodium or evipal soluble, is administered, certain analeptic agents may be incorporated in the anesthetic solution as an aid in counteracting the respiratory depressant action of the barbiturate. The amount of the analeptic agent should be small enough so as not to interfere too much with the anesthetic action of the drug.⁹

Comment

It is intended that the foregoing consideration will bring to mind some of the current views and attitudes toward various anesthetic agents and methods of anesthesia. Emphasis has been placed on those agents and methods which have proved to be safe and reliable, and mention has been made of those which are newer and as yet have not been thoroughly investigated but which may prove useful and helpful in time.

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REGIONAL ILEITIS*

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REGIONAL ileitis,* or, as it is sometimes called, terminal ileitis, appears to be a comparatively new disease. It was first described by Crohn, in 1932. He presented thirteen cases. Since that time eighteen cases have been reported from the Mayo Clinic. There have been approximately fifty other cases reported in the literature. It is difficult to believe that such a characteristic condition could long have been overlooked at autopsy. The pathologists with whom I have talked have never seen this pathologic condition until the last few years and now it is found quite frequently.

The medical literature on all diseases of the intestines was reviewed, in 1920, by Tretze. He divided all lesions of the large and small bowel into three classes: (1) those due to neoplasms; (2) those due to known specific bacterial agents; (3) benign granulomata. Under benign granulomata he described all those benign, inflammatory, intestinal tumors which are neither neoplastic nor due to specific bacterial agents such as foreign body tumors, chronic perforating lesions, traumas of the mesentery, Hodgkin's disease, late reactions to release strangulated hernia, et cetera. The entire literature was extensively reviewed and it is significant that nowhere in his article was there a description which resembled regional ileitis.

Regional ileitis is a disease of the terminal ileum usually found in young adults, twice as frequently in males as in females. It is characterized by a long standing inflammation resulting in stenosis of the lumen of the gut followed by chronic obstruction and formation of multiple

fistulae. The disease clinically resembles ulcerative colitis. In some of the cases reported by the Mayo Clinic there was a ten years' history. The patient in this report gave a history of abdominal cramps over a period of four years. The disease is characterized by cramps, diarrhea, fever, loss of weight and secondary anemia. Fever is rarely high and the leukocytosis is only slightly above normal. Diarrhea is never so severe as in true colitis. The stools contain mucus and streaks of blood. Tenesmus is lacking, as the rectum is not involved. There is pain over the lower abdomen, which is cramp-like in character, relieved by defecation. A mass can usually be felt in the lower right quadrant. This mass is tender and may be movable. Fifty per cent of the cases have had previous appendectomies. When stenosis occurs, the symptoms of obstruction appear. It is usually confined to the lower abdomen. There is seldom general abdominal distention.

The process starts at the ileocecal valve, which is transformed into a rigid diaphragm. It then gradually extends proximally up the ileum for a distance of eight to twelve inches. In the early stages it may involve the cecum and colon, but this resolves itself until only the terminal ileum is involved.

The disease is characterized by ulceration of the mucous membrane of the affected gut, with inflammation and round cell infiltration of all layers of the bowel, resulting in a marked thickening of the bowel wall. The wall of the ileum may become two to three times its normal thickness. The normal folds of the mucous membrane between the linear ulcers give a cobblestone appearance of the mucosa. The lumen of the gut

*The history of the disease given herein was taken from an abstract entitled "Regional Ileitis" by E. J. Semansky, published December 12, 1935, by the University of Minnesota.

finally becomes narrowed in places, resulting in irregular distortions and chronic obstruction. The intestine proximal to the lesions always becomes greatly dilated and may show superficial tension ulcers of the serosa.

The clinical course runs in four stages:

1. Acute peritoneal irritation, when the disease resembles acute appendicitis.

2. Symptoms of acute ulcerative colitis with ulcerative enteritis and colicky pain, fever, tenderness, diarrhea, anemia and marked loss of weight.

3. Stenotic stage with symptoms of chronic obstruction of the small bowel with a palpable mass present within the abdomen.

4. Fistulae formation. These often follow drainage for supposed appendiceal abscesses.

In the early stages it is impossible before operation to distinguish regional ileitis from acute appendicitis. There is generalized colic, pain and tenderness in the right lower quadrant. The temperature and white count are elevated. The presence of a mass usually leads to a diagnosis of appendiceal abscess. At operation in this stage, the appendix is found to be normal or may show peri-appendicitis without mucosal involvement. The terminal ileum is greatly thickened, red and blotchy, with marked edema of the surrounding tissue. There is usually free fluid in the abdomen. Sometimes an abscess is found, and, when this occurs, the pus is thick but not foul-smelling. Drainage results in intractable fistula formation.

If the case is advanced to the ulcerative stage, in addition to the symptoms mentioned, there is marked lower abdominal pain, looseness of the bowels, with pus, mucus and blood in the stools. There is marked secondary anemia. The hemoglobin is often as low as thirty-five. Loss of weight and strength also occurs. These symptoms may last for a year or more.

The disease gradually passes into the third or stenotic phase, when the symptoms are those of subacute bowel obstruction of varying degree. There is moderate distension because the obstruction is not complete. At this stage of the disease, a palpable mass is always present in the right lower quadrant. There are cramps and occasional attacks of nausea, vomiting and constipation. The exudative reaction is replaced by chronic inflammatory process resulting in fibrosis, atrophy of the mucosa, stenosis, and, in places,

polypoid hyperplasia. The mesentery is greatly thickened and fibrotic. There is enlargement of the mesenteric glands.

The marked feature of the disease is a tendency toward perforation but this occurs so slowly that it is always walled off. There is never any infection of the general peritoneal cavity but fistulae form and perforate, usually into the cecum, ascending colon, sigmoid or abdominal wall. When the fistula opens into the colon it leads to symptoms of colitis, often masking the true nature of the disease. In none of the reported cases have fistulae perforated into the rectum. In this way it differs from granuloma inguinale, which often attacks the rectum. Fistulae may develop several months after the original drainage operation. The patient reported here had the drainage operation in December, 1934. The fistula closed and remained closed until November, 1936, nearly two years, when the patient returned with an abscess of the abdominal wall in the old incision. True appendiceal fistulae can usually be closed by excision and inversion of the stump. In the absence of tuberculosis or actinomycosis, any fistulae which resist simple surgical closure should be considered as cases of regional ileitis.

The disease can usually be differentiated from ulcerative colitis by sigmoidoscopic and barium enema studies. These are negative in regional ileitis because the colon is not involved. A barium meal shows positive findings. There is definite delay of the meal through the distal end of the small intestine. In the stenotic stage this delay is striking. When the large bowel is the seat of fistulous communication one finds true narrowing at this point which may simulate carcinoma. In differential diagnosis one should consider lymphosarcoma, intestinal tuberculosis, Hodgkin's disease, sarcoma of the intestines, and carcinoma of the ileocecal valve. Exact differentiation may be possible only at the operating table or by examination of pathologic specimens. On microscopic section the bowel shows various degrees of subacute and chronic inflammation. There is no evidence of malignancy. Cultures and guinea pig inoculations have failed to show causative organisms.

Treatment.—Anemia should be combatted. Irrigations are of no value since the fluids cannot reach the involved area. Surgical treatment consists of relief of obstruction by enterostomy or

by excision. Complete resection of the diseased segment and the cecum will result in a cure in all patients who survive the operation. This is best done in two stages. The first stage consists of dividing the ileum well above the diseased area

of the terminal ileum were greatly thickened. The ileum proximal to the area affected was enormously distended and the mesentery was involved. An ileostomy was done using the Witzel technic.

Laboratory reports showed the urine to be negative. The blood hemoglobin was 89. The leukocyte count

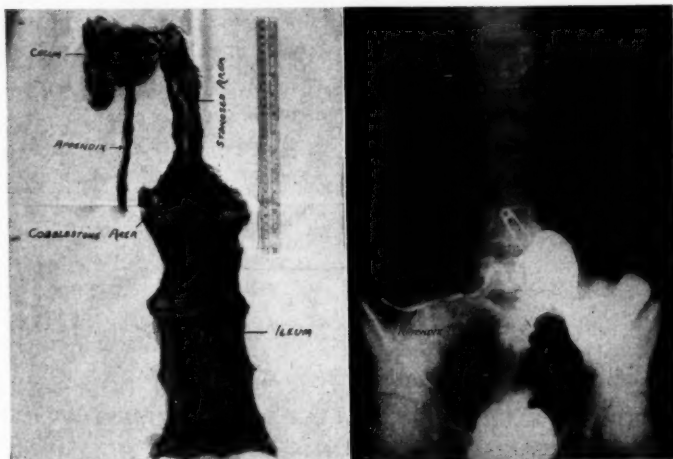


Fig. 1. (Left) The pathological specimen which was arranged by Dr. N. H. Lufkin, pathologist. X-ray diagnosis was made by Dr. Oscar Lipschultz, roentgenologist.

Fig. 2. (Right) The barium filling of a 22 cm. normal appendix.

closing both ends and anastomosing the proximal end to the transverse colon by side-to-side anastomosis. The division of the bowel is said to prevent the further spread of the disease. The second stage consists of a resection of the diseased bowel.

The following is a report of a case of regional ileitis in a patient recently operated upon at the Minneapolis General Hospital.

Case Report

Raymond P., aged sixteen, was admitted to the Minneapolis General Hospital on December 4, 1931. He gave a history of having had occasional attacks of nausea during the past two years. Two attacks were similar to the present one, only less severe. In the present attack, the patient awakened at 2 A. M., December 4, 1936, with pain about the umbilicus, nausea and vomiting, a sensation of fever, and had one bowel movement. There were no urinary symptoms. Upon admission, his temperature was 96.8, pulse 128, respiration 22, and blood pressure was 120/80. The abdomen was tender about the umbilicus and over the right lower quadrant. There was a mass in the right lower quadrant and a suggestion of rebound tenderness about the umbilicus.

The patient was operated upon December 4, 1934, the preoperative diagnosis being acute appendicitis. Postoperative diagnosis was terminal ileitis. Twelve inches

was 17,700 with 91 per cent polymorphonuclear cells. The patient made an uneventful recovery. The tube was removed in one week. He was discharged December 31, 1934, with the wound completely healed.

The patient remained well for one year. He then began to have infrequent attacks of pain in the right lower abdomen, nausea and vomiting. Attacks increased in frequency. Three to four weeks before readmission to the hospital there was more or less continuous, right lower abdominal pain and nausea, also some vomiting. Three days before admission he developed an abscess of the abdominal wall in the old incision.

He was readmitted November 7, 1936. Upon admission his temperature was 102, pulse 120, respiration 20, blood pressure 110/85. The abdomen was tender. There was a fluctuating mass in the old operative scar and a palpable mass in the right lower quadrant which was tender to touch. There was slight abdominal distension. This abscess was incised November 8, 1936. Pus had the odor of colon and cultures showed colon bacilli. Charcoal was given by mouth, which came through the abdominal wound, showing that the abscess connected with the bowel. Several transfusions were given to build him up preparatory to resection.

On November 25, 1936, the mass, consisting of distended and undistended small bowel, including the cecum, appendix, and a part of the ascending colon, was resected. The mass was firmly adherent to surrounding structures and to itself. This mass was exteriorized

and removed. The clamped ends of the cecum and ileum were brought to the outside and the abdomen was closed. Following the operation, the patient's condition was satisfactory. There was some weight loss and the patient suffered from severe anorexia.

Secondary closure of the wound was made on January 28, 1937, and since then the patient has made an uneventful recovery.

The specimen removed consisted of 45 cm. of distal ileum, the ileocecal valve, and part of the cecum. The appendix, which was normal, measured 22 cm. The cecum appeared normal. The distal 16 cm. of the ileum showed marked thickening of its wall and its lumen was the size of a lead pencil. The mesentery measured about 2.5 cm. in thickness. The proximal portion of the ileum was markedly dilated and all of its coats were hypertrophied.

Summary

1. Regional ileitis was first described by Crohn in 1932. Since that time some fifty cases have been reported.
2. It is a non-malignant, inflammatory disease of the small bowel, not easily recognized in its early stages, progressive in course and leading to fistula formation and obstruction.
3. Surgical removal of the lesion is the treatment of choice.
4. A case is reported of a young man recently operated upon at the Minneapolis General Hospital.

MESENTERIC LYMPHADENITIS

A Study Of Sixty Cases

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THE finding of enlarged lymph nodes in the mesentery of the terminal portion of the ileum is not uncommon during operations on children and young adults because of symptoms similar to those of appendicitis. The appendix in these cases is usually not acutely inflamed. There is no gross evidence of an enteritis, and the specific cause of the enlarged lymph nodes is not evident. A study was made of sixty cases of this type of nontuberculous mesenteric lymphadenitis diagnosed at operation at The Mayo Clinic.

Etiology

The exact cause of mesenteric lymphadenitis has not been clearly demonstrated. The theory is generally accepted, however, that it is associated with infection somewhere in the body, often in the upper part of the respiratory tract. Recurrent appendicitis does not appear to be the cause of the enlarged nodes because the nodes which are involved are usually not the regional lymph nodes of the appendiceal region.

Signorelli and Hosen, in a study of twenty-five cases, suggested that the cause was abnormal

heterogenous intestinal flora and advised the use of dilute hydrochloric acid, by mouth, to reduce the number of bacteria that pass from the nose and throat through the stomach and into the small intestine. Goldberg and Nathanson cultured material from the throats of eight of their patients and found that *Streptococcus haemolyticus* was present in every instance. They also made cultures from the nodes which were removed in these cases and found *Streptococcus haemolyticus* present in one case. They considered this evidence of the relationship between infection in the throat and that in the lymph nodes.

Wilensky and Hahn noted that the lymph nodes most frequently involved are the regional lymph nodes of the part of the intestine which contains Peyer's patches. They compared these discrete regions of lymphoid tissue to those of the tonsils and suggested that the mesenteric adenitis is a regional adenitis secondary to an infection of the Peyer's patches comparable to cervical adenitis which is found in the presence of tonsillar infection.

Heilman, working in Rosenow's laboratory, cultured organisms from the throats of some of our patients who were found to have mesenteric lymphadenitis at operation and inoculated rab-

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bits with the organisms. At the end of seventy-two hours some of the rabbits were found to have enlargement of the lymph nodes in the mesentery of the small intestine. Heilman suggested the possibility that the organisms that had been cultured from the throats had a tropism for the mesenteric lymph nodes and that the infection could be passed from one individual to another through the nasopharyngeal secretions. That this is a possibility is borne out by the studies of Rosenow on the selective activity of other organisms, such as those causing some forms of enteritis and appendicitis. This selective activity of some bacteria for certain groups of lymph nodes might be the explanation of the epidemic forms of cervical lymphadenitis that occur and an analogous situation might exist in cases of mesenteric lymphadenitis.

In the sixty cases studied, a focus of infection was noted in thirty-six (60 per cent). Two of these patients had pyelitis and a third had malaria. In the remaining thirty-three (55 per cent) cases the focus was in the teeth, tonsils, or sinuses. Foci of infection were noted in only 4 per cent of the sixty cases of subacute appendicitis. It is probably true, however, that a search for foci of infection was not made as frequently in cases of appendicitis as it was in those of mesenteric lymphadenitis. In one case mesenteric lymphadenitis developed during an attack of scarlet fever accompanied by a sore throat. In other cases mesenteric lymphadenitis occurred after influenzal attacks.

Age and Sex

The majority of patients in the present series were less than twenty years of age. This is the period of life when lymphoid hyperplasias are most likely to occur. Five patients were in the twenties and one was thirty-nine years of age. The youngest patient was one and a half years of age. An equal number of males and females were affected.

Pathologic Changes

The characteristic pathologic finding at operation is enlargement of the lymph nodes in the mesentery of the terminal portion of the ileum. At times the nodes of the cecum also are involved. This was true in twelve (20 per cent) cases in this group. The nodes may be 0.5 cm. in diameter or they may be so large that they can

be palpated on abdominal examination. The largest node which was found measured 8 cm. in length. The nodes are discrete and sometimes appear to be congested and red, with evidence of a surrounding acute lymphangitis. Suppuration of the nodes and formation of an abscess are said to occur, but are extremely rare.

Microscopic examination of the nodes does not reveal any characteristic pathologic change. Inflammatory or hypertrophic changes were present in all of the twenty-eight specimens removed for pathologic examination. In no instance was there any evidence of tuberculosis. Cultures of thirteen lymph nodes gave positive results in three cases; staphylococcus was found in one, *Bacillus subtilis* was found in another, and a type of organism resembling bacteroides was found in the third case. The intestine itself generally appears to be normal although there may be some moderate discoloration caused by lymphangitis. The appendix was coincidentally the site of an acute inflammation in five (8.3 per cent) of cases in this group. The spleen and other lymphoid structures of the body are usually not enlarged. Coleman found that in 90 per cent of the eighty-six cases which he studied there was an associated cervical lymphadenitis. In the present series, only three (5 per cent) of the patients had cervical lymphadenitis.

Symptoms and Diagnosis

The symptoms of mesenteric lymphadenitis resemble those of appendicitis very closely, and clinically there is no way to distinguish one from the other with certainty. Pain, sometimes colicky, was usually the first symptom in the sixty cases under consideration. As in cases of appendicitis, this pain may start in the upper portion of the abdomen and later become localized in the right lower quadrant. Nausea and vomiting were present in a little less than half of the cases and diarrhea or constipation occurred in only about 16 per cent of cases. The temperature and pulse rate were usually only slightly elevated, and the number of leukocytes varied from 8,000 to 15,000 per cubic millimeter of blood. The differential count of the leukocytes was not significant and showed only a moderate increase in the polymorphonuclear leukocytes. Examination of the abdomen revealed that a localized region of tenderness was present

in fifty (83.3 per cent) of the cases. This tenderness was confined to the right lower quadrant in thirty-seven (61.6 per cent) cases. Reflex spasm of the right rectus muscle was found in twelve (20 per cent) cases and an abdominal mass was palpated in three (5 per cent) cases. In most of the attacks of mesenteric lymphadenitis the signs and symptoms are mildly acute, similar to those of acute or subacute appendicitis. In other cases, however, attacks occur over a period of years and are definitely of the chronic recurring type. Thirty-three (55 per cent) of our cases could be classified as chronic mesenteric lymphadenitis. In these chronic cases the symptoms varied from mild recurrent attacks of abdominal pain, accompanied by a slight increase in temperature, to the occasional case in which the pain was severe and was associated with nausea, vomiting, and high temperature. The symptoms were atypical in these latter cases and a positive diagnosis of any kind was difficult to make.

The results of a comparative study of the symptoms in the sixty cases of mesenteric lymphadenitis with the symptoms in sixty cases of subacute appendicitis in which the individuals were less than twenty years of age are given in Table 1. The similarity in the incidence of the various symptoms is evident. The only significant differences are the frequency of previous attacks and the infrequency of reflex rigidity of the rectus muscle in the cases of mesenteric lymphadenitis.

The clinical diagnosis is usually appendicitis, and in forty-eight (80 per cent) cases in this group this was the diagnosis. As evidence that the clinical picture of appendicitis was not clear cut, twenty of these forty-eight diagnoses were qualified by statements suggesting the possibility of the presence of some other condition. In only three cases was mesenteric lymphadenitis suspected before operation. Diagnoses other than appendicitis were: intestinal obstruction, mesenteric tumor, Meckel's diverticulum, and intussusception. In 95 per cent of the sixty cases of subacute appendicitis the diagnosis was unqualified.

Treatment

Even if the true diagnosis is suspected clinically, operation is indicated in almost all cases to exclude the possibility of appendicitis. If this

TABLE 1. SIGNS AND SYMPTOMS OF MESENTERIC LYMPHADENITIS COMPARED WITH THOSE OF SUBACUTE APPENDICITIS

Signs and Symptoms	Mesenteric lymphadenitis (60 Cases)		Subacute appendicitis (60 Cases)*	
	Cases	Per Cent	Cases	Per Cent
Nausea	25	41	34	56
Vomiting	29	48	24	40
Diarrhea	7	11	5	8
Constipation	15	25	7	11
Rigidity	12	20	31	51
Chills	1	1	5	8
Distention	5	8	1	1
General pain	21	35	27	45
Foci of infection	33	55	24	40
Previous attacks	37	61	21	35

*All patients were less than twenty years of age.

policy is not adopted a number of patients who actually have acute appendicitis will be denied early operation because of the difficulties in clearly differentiating these two conditions by clinical examination. In certain cases acute appendicitis and mesenteric lymphadenitis may both be present. When mesenteric lymphadenitis is discovered at operation the appendix is usually removed, even though it is not acutely inflamed, and any exploring that seems indicated is carried out. Subsequent to operation, all foci of infection should be removed and general measures should be instituted to build up the health and regulate the habits of the individual. It is doubtful that operation has any direct beneficial effect on the adenitis; in one case, a second operation was performed, elsewhere six weeks after the first operation, and the mesenteric lymph nodes were found to be still enlarged, with some signs of inflammation. In all probability, the apparent beneficial effect of operation in these cases is the result of rest and care after operation. In the cases of chronic mesenteric lymphadenitis in which symptoms persist, roentgenologic treatment may be of value.

End Results

The risk of operation in the presence of mesenteric lymphadenitis is ordinarily very

slight. There was one postoperative death in the group of cases studied. This occurred several weeks postoperatively; the patient was a child, one and a half years of age, who had been ill almost since birth and was in a very debilitated condition at the time of operation. The lymph glands in this case were tremendously enlarged and could be easily palpated through the abdominal wall.

The final results following appendectomy and abdominal exploration in cases of mesenteric lymphadenitis have been fairly satisfactory. We do not wish to infer that operation in these cases affected the natural course of the disease to any appreciable extent. Follow-up studies on forty-nine patients showed that thirty-six (73.4 per cent) had no further recurrence of symptoms. One patient died from causes not related to the enlarged lymph nodes. Recurrent attacks of abdominal distress, usually mild, occurred in twelve (24.6 per cent) of cases. Of these twelve patients, nine had attacks for a period up to a year, one for a period of two years, and two for a period of three years or more following operation. It is interesting that in one of the latter cases abdominal symptoms recurred each time the patient suffered from an acute infection of the upper part of the respiratory tract. It is possible that recurrent or persistent chronic mesenteric lymphadenitis over a period of years may be responsible for the calcified mesenteric lymph nodes that are occasionally seen

during roentgenologic examination of the abdomen.

Summary

Sixty cases of nontuberculous mesenteric lymphadenitis have been reviewed. Various theories of the etiology of this condition have been considered. The most generally accepted theory is that mesenteric lymphadenitis is associated with a focus of infection somewhere in the body, usually in the upper part of the respiratory tract. A comparative study of the symptoms in sixty cases of mesenteric lymphadenitis and in sixty cases of subacute appendicitis has been made, and it has been noted that there are not significant differential points. In view of this similarity of symptoms we do not believe that medical treatment is justified when the appendix has not been removed previously, even when the diagnosis of mesenteric lymphadenitis is suspected, because a definite appendicitis may be neglected if operation is not performed. Follow-up studies showed that 73.4 per cent of patients have no further trouble following operation. The remainder may have subsequent attacks.

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INSULIN IN THE TREATMENT OF SCHIZOPHRENIA*

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IN 1922 Banting and Best,¹ working on depancreatized dogs, developed an extract of the pancreas which would lower the blood sugar of the dogs and stop their glycosuria. Later they² tried this extract, insulin, on diabetics and obtained the same results. At that time it was thought that insulin would be of use only in the treatment of diabetes mellitus, but since then it has been used in many other conditions. Its most

obvious action and probably one of its most important actions in the body is the reduction of blood sugar. Whether this is brought about directly or through the liver being made able to store glycogen is not the problem for discussion here. Sevringhaus, Kirk, and Heath,⁷ in 1923, found that the extent of the hypoglycemia after the injection of insulin is so variable that the degree cannot be predicted from the dose per kilogram of body weight. They also found that with the increased dosage of insulin both the extent

*Read before the Ramsey County Medical Society, March 29, 1937.

and the duration of the hypoglycemia became greater. Insulin, because of its ability to reduce blood sugar, has been used with success to stimulate the appetite in patients following a long and debilitating illness and in patients who refuse to eat.

The uses of insulin are many and varied, and one of the most interesting recent developments is its use in the treatment of schizophrenia. We have known since it was first employed that insulin would cause weakness, coma, and convulsions if a sufficient amount was taken to lower the blood sugar below certain levels. These levels are variously found to be from 70 to 80 mg. per 100 c.c. of blood. Anyone who has treated diabetics with insulin knows that the patients must be warned about insulin reactions as these are often dangerous, particularly if they occur while the patient is at work or in some situation where help cannot be obtained immediately. Most diabetics complain bitterly about repeated insulin reactions. As early as 1923, Carvil, Parsons, and Raphael³ began to use insulin in some cases of mental depression. In 1933 Sakel,⁴ working in Pötzl's clinic in Vienna, introduced the method which is used at present. He observed that patients who were morphine addicts and who had received large enough doses of insulin in the course of their treatment to cause them to go into coma or hypoglycemic shock had changed personalities when they again became conscious. He reasoned that as dementia precox is a problem in personality changes, insulin shock might be of some benefit to patients afflicted with this disorder. He worked out a form of treatment for these patients which is essentially as follows: Small doses of insulin are given three times daily and then the dose is gradually increased until the patient is put into insulin shock. The patient is allowed to remain in shock for an hour or an hour and a half, at the end of which time the shock is terminated by the administration of 150 gms. of glucose through a nasal tube.

There are several types of shock which the patient may develop, namely, convulsion shock, dry shock, or moist warm shock. Any other type except moist warm shock should be stopped immediately because its development may cause irreparable damage to the patient. In our experience we have seen different types of shock in the same patient. One patient had a convulsive type in her third shock, after

the first two had been of the moist warm type. She was very restless during all of the shocks and had to be watched very closely. Another patient was given three large doses of insulin in one day and went into a state of hypoglycemia from which he did not recover for three days, even though intravenous glucose and other measures were used and his blood sugar had returned to normal. At one time during the hypoglycemia he began to develop edema of the lungs and his life was almost despaired of.

Another factor which must be considered carefully in this method of treatment is sensitivity to insulin. Insulin as it comes on the market is made from a combination of cow, sheep, and hog pancreas. A patient sensitive to beef, lamb, or pork, therefore, will be sensitive to the insulin obtained from the pancreas supply obtainable on the market and may develop severe anaphylactic shock instead of the desired hypoglycemic shock.

Katzelbogen and Harms⁵ call attention to the disconcerting fact that the hypersensitivity may not manifest itself at the beginning of the treatment but may appear later on in the course of the treatment. They also state that a given dose of insulin may not cause any reaction on one occasion and later on may result in a severe hypoglycemic reaction. The level of blood sugar has not proved to be a consistently valid criterion by which we may forecast the possible occurrence and severity of hypoglycemic reactions.

Excessive salivation is another factor which must be watched since it presents a menace to a patient in a comatose state.

As very small doses of insulin, fifteen units, for example, may cause some individuals to go into hypoglycemic shock, everything must be in readiness for the care of the patient before the treatment is begun.

Glueck⁶ says: "The far reaching manifestations of insulin shock are well known. It is conceivable, therefore, that the deliberate introduction of a profound state of hypoglycemia, with the necessity of exploiting its effects to the furthest possible limits short of endangering the patient's life, as is required in this form of therapy, carries with it a considerable element of danger. No other form of psychiatric therapy requires as much care, skill, and caution in its application as does this. It requires also a type of nursing personnel and hospital organization second to none in efficiency, team work, and

readiness for emergency intervention." Reports in the literature have been noted of deaths during the course of this therapy from coronary thrombosis, necrosis of the pancreas, and pulmonary edema.

In closing, let me emphasize Glueck's statement regarding the danger of this method of treatment and the importance of having a nursing personnel experienced in the handling of these cases.

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INSULIN SHOCK IN THE TREATMENT OF SCHIZOPHRENIA*

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IN calling attention to the method of treating schizophrenia by producing insulin shock there is no need to be equivocal. By these shocks we are subjecting the patient to a critical physical malady.

The only justification for causing him to undergo this danger is found in the fact that schizophrenia is a permanently disabling disease. Only about 15 per cent of patients recover from it when treated by the customary means such as have been at our command.

The injection of necessarily large doses of insulin creates, in the words of Professor Claude, "anarchy" in the activity of the somatic, neuro-vegetative, and psychic functions. The risk of producing coma through hypoglycemia is great for the patient, but it also burdens the physician and the attendants, who must foresee and be prepared to meet instant emergencies.

Hoff¹ described the treatment in the *Wiener Klinische Wochenschrift* of July 17, 1936. We began to use it in September, 1936, carrying out his directions in detail. He divides the procedure into four phases. In Phase I, intramuscular injections of insulin are given in increasing amounts so that as quickly as practical the dose will be known which will throw the patient into shock and coma. Phase II is fixed through the repetition of these deep shocks once daily for six days. On the seventh day no treatment is given, but the patient is observed for any change in the symptoms of his psychosis. The establishment of this day for observance sets up Phase III. The six days of shock and one of rest

are continued until the symptoms of the psychosis have gone through a certain unfolding. Then the deep shocks are stopped although smaller amounts of insulin are given. During this process of reduction, which is Phase IV, the patient is closely watched for signs of his disorder which may recur in this phase when he is hypoglycemic following the injection.

From this description you will see that the crucial period of the treatment in which the life of the patient is imperiled is during Phase II, that is, when he is being thrown into shock and coma.

In this phase the necessary insulin is given in one dose before breakfast and on a fasting stomach. Within a short time the patient shows the usual signs of hypoglycemic shock. In it he perspires freely, his skin feels cold, soft, sticky, and adhesive. He may feel weak, fearful, and express apprehension, but more often he complains of no special sensations. In the time which elapses between the beginning of shock and the appearance of coma, the patient is hypoglycemic. The duration of this hypoglycemic state before the onset of coma varies from three-quarters of an hour to five hours. In this interval the patient shows his individual reaction to the shock. In four of our cases the patients were composed during it, the only signs of agitation being fibrillary muscular movements or occasional paroxysmal jerking of the extremities. In other instances the appearance of shock is followed by changing intensity in mental perturbation, the voicing of a deep foreboding, gradually leading into wild cries and violent physical activity. In three cases the activity took

*Read before the Ramsey County Medical Society, March 29, 1937.

the form of a more or less constant writhing of the entire musculature, resembling the torsion spasms observed in diseases of the lenticular nucleus. Two of these people showed, in addition, widely opened staring eyes with a divergent squint. Another patient who was very agitated during the shock wore a good deal of the hair from the back of her head by throwing herself into opisthotonos, as a wrestler might in "bridging." One patient who was noisy and agitated was regularly seen lying on her side with her head extended backward as if she had a meningitis, while clonic contractions of her extremities were evident. Her eyes were widely open and fixed in vacant stare, but showed no squint. One other patient, who was violent, developed convulsive seizures which alternated with deep coma for two days, in which we almost despaired of saving his life (dry shock). The patients which showed violent activity while in shock were all of them so agitated that they had to be placed in full restraint during it. The violence of their exertions of course places an extra load upon the heart. However, the pulse rate seldom rose above seventy beats a minute in any of them, and occasionally a rate as low as fifty-six was noted. The breathing rate was not usually modified excepting when they screamed for a long time. The temperature when taken in the shock was usually subnormal.

Reactions in hypoglycemia, such as described, usually repeat themselves daily, the patient going through the different states with clock-like regularity, so that after the first few the attendant can with a degree of certainty foretell at any given period how long it will be until coma supervenes. The quiet patient may gradually become somnolent and fall into coma as if he were going to sleep. The agitated, noisy ones may suddenly become comatose, or a period of quiet may precede its onset. One active patient displayed catatonic postures before her coma. It will be noticed that the description so far has referred to the physical behavior of the patient.

The number of necessary successive shocks may vary greatly. Some patients require fifty or sixty, while others recover after only a few. If the patient responds to the shocks in the typical manner early in the treatment, he becomes lucid during the hypoglycemic stage. When he is not hypoglycemic he displays his psychosis. If the shocks are followed by improvement, this lucid

period gradually stretches itself over the whole of the time, even when he is free from hypoglycemia, that is, after he is brought out of the shock. Toward the conclusion of the treatment a reversal reaction occurs. By this is meant that during the time when he is not hypoglycemic he is free from psychosis, and in the hypoglycemic period itself he shows his definite mental disturbance (activated psychosis). The treatment is continued when this state is reached until he is sane, even in the period in which he is hypoglycemic; that is, immediately preceding the onset of coma. It is important at this time when the patient is still being thrown into deep shock not to counteract it too quickly or abruptly before coma. If this is done, he may become far more disturbed mentally than he was before the treatment was begun, and may remain so. When the patient displays lucidity both during hypoglycemia as well as afterwards, the fourth phase is begun. In it the dosage of insulin is reduced. The patient must be closely watched for the appearance of any signs of his psychosis when he is hypoglycemic following his injection. If he remains free from symptoms, the insulin is gradually reduced and discontinued.

Report of Cases

The first case to be presented in detail is that of a woman thirty-six years of age, whom I first saw in 1931, when she was nervous and sleepless, complained of headaches and found it increasingly difficult to do her work. The sides of her scalp were tender, and she imagined she had a mastoiditis. She recovered from this attack in about four months and went back to work, working steadily until February 24, 1936. She then complained of headaches, difficulty with her work, but in addition to this, even this early, had the idea that her employer was watching her. She did not stop work, however, until June. In this interval she had become increasingly suspicious of everyone with whom she came in contact at her work. Her definite ideas were related to her employer, whom she believed had hired detectives and fellow employees to watch her. Gradually she became more seclusive and reserved except when questioned. She also became more apprehensive, more constantly certain that she was about to be arrested. After stopping work she remained in bed for several weeks at home and during this period was increasingly resistive to all efforts made to handle her. She refused to leave the house at first. Her delusions of persecution grew until she was constantly fighting with her brother and mother, and frequently attempting to run away in order to avoid arrest. She entered the hospital in October, and was given insulin the next day. She received fifteen

shocks. Her psychosis completely disappeared and at the end of this time she was given smaller doses. She had made a complete recovery, resuming work about the first of the year. She has been intermittently employed for a period of two months, and has been working steadily as a bookkeeping-machine operator for the last three weeks.

The second case is that of a man who was first admitted to the hospital in June, 1936, with the history that about six months before, he had lost his job. Following this it was noted that he became morose, secretive, and began to do odd things, such as breaking dishes, throwing violent fits of temper, and tearing up papers and letters. He was placed in a private hospital for several weeks, and at that time showed no improvement. He entered the hospital for the second time on the 3rd of October. Upon questioning, then, he appeared to be quiet spoken and well oriented. He believed his former employer had him fired because he "had it in for him." He felt himself intellectually superior to his associates. He admitted breaking dishes at home to "put his mother on trial" and to "learn to make her take it." He was convinced that he had most of the family responsibility. He occasionally seemed very depressed, refusing to speak. Within the next few days he improved somewhat, but, at times, refused food and laughed in a silly way when nothing humorous had occurred. It was noticed a few days later that he became increasingly seclusive, keeping his head under the bedclothes most of the time and apparently not noticing anything which was going on about him. He was put on insulin, the dose built up rapidly, and he had his first wet shock early in the morning. However, he received another large dose of insulin later in the day which was followed by shock, and later in the evening still another dose also followed by shock. After the last dose he developed an attack which was associated with pulmonary edema, cyanosis, frothing at the mouth and a convulsion. This was combated and the next day he was sent into shock again and in it he developed an epileptic seizure, a rather typical grand mal convulsion. It was necessary to use artificial respiration to revive him from this attack. Subsequently he remained in this comatose epileptic state for two days while every effort was made to revive him. It was learned afterwards that he had had several convulsions previous to his entrance to the hospital, but this fact was concealed when his history was taken. He recovered from the convulsive state gradually. He was intensely weak and regained his strength very slowly. However, his psychosis had undergone a marvelous improvement and he left the hospital after six weeks. A few days after leaving the hospital, he took employment with his brother-in-law, driving a delivery truck. He kept the route going, continued work until the latter part of February, when he stopped and attempted to find a better job. During this interval since February, he has been causing trouble at home. He is abusive and argumentative, especially with his mother. His father came in to see me about a week ago, stating that he wished

I would tell him to go to work again, because he thought he was less troublesome when employed. When the patient was interviewed there was no psychosis present, but he displayed a certain air of superiority which was disturbing. He is amenable to certain type of handling and he decided it might be just as well if he went back to work.

A third patient entered the hospital November 11, 1936, at the request of a friend. He had been in good health until a few days previous to admittance. The evening before he entered the hospital he shattered his mother's car by firing a shotgun at it. The same day he had rung the church bell at 3 A. M. because he had lost his dog. Upon questioning the patient in the hospital, he said repeatedly that he wanted to go back to get his dog, and added that he could get the dog if his mother would not stop him. He said she had been holding him down for twenty-seven years. The following day the patient said he heard a thousand voices and that he thought the other patients believed him "nuts," but that he convinced them he was not. On admission to the hospital he was violent and had to be placed in full restraint. He fought these lustily; he was noisy and sang in a very loud voice. He cursed, threw water and spit at the attendants, and constantly tried to get out of restraint. For the first few days he called frequently for his dogs and for a priest to come in and clean him up, and at one time called for fifty million Frenchmen to come and help him. He claimed he had complete charge of all the patients in the room. After about a week in the hospital he became more cooperative and could be allowed out of restraint. At this time he talked rationally with his wife about his condition and asked for her pardon for his conduct. However, he still had ideas in regard to his dog and felt that he had been told by a "voice" to shoot his mother's car. Underneath his superficial adjustment he was still delusional and hallucinated. He was placed on insulin which was quickly increased to the shock dose. He was sent into shock and coma fifteen times. By this time his psychosis had entirely disappeared and his insulin was reduced and discontinued. He has not been working because he cannot find a job, but he has no psychosis at present.

A fourth case is that of a young man who had been peculiar since puberty. He was nineteen years of age. He was stubborn, acted superior, was quarrelsome, and had attempted suicide by drowning. He had a simple schizophrenia. He was treated with fifty-four shocks and shortly after the fifty-fourth shock, met death accidentally.

The fifth patient developed a psychosis while under my care. She was thirty-two years old and was troubled with hallucinations and delusions. She believed her aunt was up in the ceiling talking to her. She also felt that her family was always outside of the door conspiring against her to have her taken to the State Hospital. These symptoms were present for about three months before the insulin treatment was started. She received ten shocks in all. At the end of this time her psychosis had improved. She went home to live with

her husband, who in some manner or other greatly irritated and disturbed her. While at home she became very emotional. After she had been there a month, she said that occasionally when she was upset she had peculiar ideas like those she had had before she received the insulin. She has not come in for about two months, but when she was last seen she told me she was divorcing her husband and hoped that things were going to be better for her.

The sixth case is that of a young man twenty-five years of age who had been peculiar since puberty, and for the last three years had been exceedingly worried and anxious. About a year ago he entered the State Hospital as a voluntary patient, where he seemed to be making a nice recovery. He decided, before fully recovering, that he would go to a CCC camp in the north woods. He felt that he would get along better if he could adjust himself there rather than in the hospital. He went to camp for six weeks and found that the boys did not like him and this created anxiety as to whether or not he was as capable as he thought himself to be. He left camp, came down to the hospital and asked to be admitted. On entrance he paced constantly, asked questions, was querulous, fretful, worried and doubtful. After three weeks in which he showed no improvement, insulin treatment was begun and he was given thirty-four shocks in all. After this he decided he felt better and was less tense and worried, and asked to have them stopped. While he was not completely cured, he felt that the treatment had improved his condition to a large extent. When the insulin was stopped he was permitted to go home. It was impossible for him to live at his mother's home because his father was dying there from cancer. His mother is an epileptic. So from the hospital he went to visit an aunt in Minneapolis, where he was unable to make an adjustment. He could not find work to support himself, so he decided to go back to the State Hospital voluntarily and take advantage of the protection the institution offered him.

Case 7 is that of a woman twenty-four years of age who had been sick approximately three months. Her psychosis occurred while she was pregnant. She was put on insulin and received thirty-two shocks. So far there is little improvement.

Case 8 is that of a woman thirty-four years of age who has been sick for about four years. She said she heard her dead mother's voice directing her every action. She constantly pleaded to be permitted to go home. Whenever she becomes nervous she has a startling mannerism, she hiccoughs and coughs at the same time so loudly that she can be heard all over the floor of the hospital. She was placed on insulin treatments and given sixteen shocks. After the sixteenth shock she ran away from the hospital. She has been seen at home since, where she seems to be adjusting well and is free from the symptoms of her psychosis. Her eruptions have ceased.

The patients in this series spent an average number of forty days in the hospital under treatment.

Hoff¹ reports an average of fifty-five days in the hospital for his patients taking insulin shock treatment.

Of the six patients who have completed the treatment, four recovered and two improved. A seventh died accidentally. Three are still under treatment. Three of the patients who recovered were sick four months, eight months and three weeks, respectively. The fourth was sick four years. All of these cured patients showed, as symptoms of their disease, hallucinations and delusions. Hoff¹ also stresses this point, that is, that these symptoms respond to the treatment.

The statistics of recovery according to Muller and Munsinger,² covering 300 cases seen in Vienna and Switzerland, and on which they reported at the Paris Symposium in February 1937, were grouped according to the duration of the disease.

Group I: Disease of less than six months' duration: 89.8 per cent improved, including 73 per cent completely cured.

Group II: Disease of more than six months' duration: 80 per cent improved, including 50 per cent cured completely.

Group III: Disease of more than eighteen months' duration: 45 per cent improved but 0.5 per cent cured.

These figures are in marked contrast to the statistics usually quoted regarding the remissions in schizophrenia.

As to the manner in which the treatment influences the disease, no one has as yet offered a satisfactory explanation.

All men who have had experience with mental disorders have, however, seen intercurrent disease favorably influence schizophrenia.

An example of a case of this type is a patient who was treated for a violent catatonia, by inducing somnolence with somnifene given intramuscularly. The treatment was entirely unsatisfactory until she developed an extensive abscess under the fascia lata. She recovered promptly from her psychosis following the infection.

It may be that the treatment with insulin functions as an intervening illness, for certainly the deep shocks are in themselves a grave disease.

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DIATHERMIC TREATMENT IN PERIPHERAL ARTERIAL INSUFFICIENCY

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THE following article is based on the writer's clinical observations and experiments with diathermy in arterial insufficiency over a period of eight years. The work, at least in some aspects, is new, and therefore extensive reference to the literature is impossible.

The American literature contains few adequate reports concerning the use of diathermy in the treatment of arterial insufficiency.

Chevalier and Chezet⁷ report excellent therapeutic results.

De Kraft⁸ says, "The action of diathermic currents on the walls of the blood vessels is conducive to improvement in their nutrition. . . . Restoration of at least a part of the elasticity of arteries has been observed, as well as improvement in their caliber."

Barbash¹ reports consistently good results in the use of medical diathermy in gangrene. He especially emphasizes its use in diabetic gangrene.

Recently Veal and McFetridge¹¹ have studied cases of intermittent claudication by thorotrast injection of the arteries. Most of these cases were clinically typical cases of arteriosclerosis. These studies showed: (1) obliteration or diminished lumen of the larger arteries; (2) diminution in the number of the larger arterial branches to the muscles with uneven and inadequate distribution; (3) inadequately distributed new collateral blood supply. They state that the process begins in the muscular branches, which become short and clubbed, with eventual progression to the larger arteries, which in turn become narrowed and then obliterated. They conclude that there is a change in the nutrition of the muscles. They show the arteriograph of a patient after treatment, noting some increase in the lumen of the larger arteries and a more adequate distribution of the collateral circulation.

However, Buerger,⁶ speaking of postural exercises, says, "This method does far more to improve the circulation than either the application of superheated air (so-called baking treatment) or the diathermic current." He states further regarding diathermic treatment, "This is an ex-

cellent method of obtaining the effects of heat upon deeper parts, and is particularly applicable to the early cases, especially those in which intermittent claudication is the most marked symptom, and in those patients in which ambulatory treatment must be carried out. In the presence of inflammation, migrating phlebitis, ulcers or gangrene, it does not seem to be well borne or beneficial. The seances should last from twenty to twenty-five minutes."

We do not agree that gangrene or ulcers are contradictions to diathermy. Rather in our experience they are definite indications. Neither do we feel that twenty to twenty-five minutes is adequate for a diathermic treatment. It has been shown, for example, by thermocouple measurement, that forty minutes are required to raise the temperature of a knee joint by diathermy. A proper diathermy treatment, however, affects the circulation for some time after discontinuing the current, thus in effect prolonging the treatment. This is more particularly true if the extremity is wrapped in woolen blankets after treatment. The local hyperpyrexia is terminated eventually, of course, by the circulation, the rapidity of temperature decrease being in proportion to the adequacy of the circulation, assuming that external heat loss is kept to a minimum.

Kovacs,¹⁰ in discussing peripheral circulatory disturbances, says: "Electrical measures, diathermy and galvanism are used to relieve pain and spasm or to bring about active hyperemia and better nutrition." Concerning thrombo-angiitis obliterans, he says, "The lack of circulation is responsible for the severe attacks of pain and later the total occlusion of blood vessels leads to various forms of gangrene."

"Diathermy is undoubtedly beneficial in early cases, it controls the pain and will gradually bring about a functional restoration. . . . As a rule these patients tolerate only a very moderate amount of heat, possibly not more than 300 to 500 ma. The current may be applied for one-half hour or more. In placing the electrodes it is not necessary to include the parts where there is

circumscribed pain, the toes, for instance, for the affected parts are very sensitive to even moderate direct heating. The speeding-up of the circulation of the rest of the leg is sufficient to bring about the desired improvement in these peripheral parts." We agree with Dr. Kovacs.

Technic

Our technic of treatment is as follows: The patient is seated in a comfortable chair with the knees extended beyond a right angle. Both feet are placed in contact with soaped metallic foot plates. These foot plates are insulated from the floor, as are the connecting cords when necessary. (Some machines will show up considerable leakage through the insulation of the cords if special precautions are not taken.) The heel and longitudinal arch must be insulated by means of a folded towel or other insulating substance. The insulation extends up to the transverse arch. This is a very important detail, as otherwise the path of lesser resistance is directly up through the heel and along the Achilles tendon. When the current follows the latter path, the foot is poorly heated, and discomfort may arise in the ankle from the overheating. It is immaterial whether cast foot plates or block tin is used. The patient should be connected in series with the high voltage terminal of the machine, which should be one of ample capacity.

After assuring oneself of the correct set-up, the current should be turned on slowly and increased very gradually, taking care not to over-run the maximum tolerance during the early part of the treatment. Clinical experience with the treatment is of considerable aid in estimating in advance the rapidity with which the current may be increased. The history and physical findings are also of great value in this regard. It is desirable to obtain a rough estimate of the maximum tolerance of the extremities during the early part of the treatment. We find that a lower extremity normally has a tolerance of 600 m.a., and an upper extremity of 200 m.a.

Treatment must be given daily at first, sometimes even twice a day. Treatment two times a week or at longer intervals is likely to be unsuccessful. Clinically, when it seems that the maximum improvement has been obtained, the vascular improvement already obtained may be retained by a treatment frequency of once or twice a week. The starting dose is 60 to 75 per cent of

the *tolerance* and is increased slowly. The occurrence of moderate pain during treatment or of superficial paresthesias of the fingers or toes are signs of improvement. Even severe discomfort occurring early in the treatment must not necessarily be considered to be an unfavorable occurrence. It is apparently due to the increased circulation in an area which has previously become accustomed to an inadequate blood supply. When these symptoms occur, however, it is well to be conservative as to the diathermic dose for a few days, but treatment should be continued.

Raynaud's Disease

L. L., female, aged thirty-five, on December 29, 1931, complained of a dead feeling in the hands. There was a history of numbness and tingling of the fingers the previous spring which cleared up during the summer, but returned with the cooler weather of the fall. The patient stated that there was a very marked blanching of the hands at times of emotional upsets, especially when she cried. Her grandfather died of angina pectoris.

The examination was essentially negative except for constricted capillaries of the finger nail bed. The blood pressure was 110/70 at the time of first examination. The diathermic tolerance test showed a normal arterial dilatability of the right hand and 75 per cent of normal in the left. The area of maximum temperature reaction, as might be expected from the test, was in the left hand and most marked in the fingers. Therefore, with a normal diathermic tolerance in one hand and 75 per cent of normal in the other, we concluded that there was only a small amount of organic disease, and that confined to the left hand. Inasmuch as the greatest heat was observed in the fingers, we concluded that whatever organic involvement was present was confined to the smaller arteries.

The patient was treated with diathermy only twice a week for two months. There were few objective signs of disease, so there were few objective signs of improvement. Her diathermy tolerance, however, increased to normal in the left hand, suggesting an improvement in the early organic condition in that hand, probably due to the development of adequate collateral circulation. The capillary findings too became normal. Subjectively the patient stated that the cramps formerly occurring in the forearm had disappeared. The hands and fingers remained warm.

Buerger's Disease

In Buerger's disease we find a definitely diminished diathermic tolerance which increases slowly under diathermic treatment. This indicates, therefore, an organic lesion of the peripheral arteries. This diminished diathermic tolerance apparently parallels a clinically de-

creased arterial supply. Two case histories illustrating these findings follow:

N. H., male, aged thirty-one, had suffered for seven years (since 1924) from sensitiveness of his feet to cold. He also had numbness and tingling of the toes. His feet were frozen in December, 1924, and some of his toes were amputated. Later one toe became gangrenous and dropped off. He later developed intermittent claudication. Two years previously his fingers became sensitive to cold. Blanching of the finger-tips was said to have occurred even in the summer. There was no local resistance to infection.

Beginning in April, 1931, the patient was treated with typhoid injections and diathermy. At this time the fingers were semi-gangrenous throughout the distal half. The diathermic tolerance was at first about one-third of normal, thus being, as judged by past experience, in the zone of potential amputation. Both hands and feet were treated morning and afternoon with the result that both began to improve clinically and the diathermic tolerance reached 50 per cent of normal for the feet in one month, while the hands reached 50 per cent of normal in three months. In five months the tolerance of the hands had reached 75 per cent of normal while the feet showed 66 per cent of a normal diathermic tolerance. This is explained by the fact that the hands were treated more intensively during this period than the feet. During this period the dry gangrenous areas separated, the color returned to the fingers, the ulcerated areas healed, and extreme sensitiveness to cold disappeared.

Except during the first month this patient was unable, for financial reasons, to receive treatment more often than two or three times a week, more commonly the former. His tolerance is now 90 per cent in the hands, and 75 per cent in the feet. The improvement clinically has closely paralleled the increase in diathermic tolerance. The treatment was spread over a period of a year. The technic mentioned in this article was closely followed.

* * *

W. C., male, aged forty-six, developed, in 1922, a blood pressure of 190/115 under intensive office work. Previous to this there were suggestions of anginal symptoms. In 1926, intermittent claudication appeared. The history of bilateral amputation of his father's feet seemed ominous. In July, 1926, diathermy at intervals of a week was instituted for a total of eight treatments, (not under the author's supervision). Then followed an interval out of town for six months during which time he was symptom-free. Intermittent claudication then returned in March, 1927. In 1929, a total obstruction developed in one of the smaller arteries of the calf. During this general period the diathermy treatments were given for short periods of fifteen minutes (not under the author's supervision).

Treatment was begun with the present diathermy technic in March, 1929. The patient's diathermic tolerance in the lower extremities at that time was about 66 per cent of normal. He was treated then with 200

ma. for 45 minutes daily for several months without much objective evidence of improvement. Subjectively, though, the patient felt that the symptoms were less severe. He then took a trip in the Tropics. On return, he purchased a diathermy machine and continued daily treatments at home. In 1931, his diathermic tolerance in the lower extremities was about normal. This paralleled his clinical condition both subjectively and objectively. The intermittent claudication had disappeared. He was then able to walk a reasonable distance without discomfort. He eventually died of coronary thrombosis.

Arteriosclerosis

In arteriosclerosis other findings, of course, make the diagnosis. It is interesting to note, however, that there is a decreased diathermic tolerance which also closely parallels the clinical history. Improvement under treatment, however, is slower and less complete than in Buerger's disease.

T. H., male, aged sixty, in February, 1931, could not walk more than two blocks without having to stop and rest. Two or three holes of golf was his limit. His left foot was frequently cold. Capillary studies showed decreased capillary flow but were otherwise normal. There was no increase in the local blood supply to the feet after typhoid injection and reaction. Aceoline injections were discontinued and return of the intermittent claudication was experienced.

On June 25, 1931, diathermy was begun. The diathermic tolerance was 33 per cent. Since then the tolerance of the legs increased to about 70 per cent. The clinical improvement paralleled this improvement in the diathermic tolerance. The patient is now living a fairly normal existence for a man of his age, and the diathermy treatments are given at irregular intervals. His intermittent claudication has practically disappeared.

Discussion

We find that there is an arterial reserve function or dilatability comparable to the functional reserve of the heart, and that when a heat load is impressed upon an extremity, the arterial system under these conditions seems to dilate to the maximum of its capacity before damage from overheating is permitted to occur. When the application of diathermic heat is continued the circulation of the extremity is improved. In Raynaud's disease the improvement is thought to be due to relaxation of the arterial wall with restoration of the normal lumen, while in arterial sclerosis the improvement in arterial circulation is probably due primarily to the establishment of an adequate circulation. In Buerger's disease it is probable that both the lumens of the original vessels are improved and an adequate collateral circulation established.

We feel that diathermy applied in the manner described is the best *local* therapy for arterial insufficiency of the extremities. It is definitely reconstructive and the effects appear to be lasting. In many cases of organic arterial insufficiency this method of diathermic treatment is almost specific.

Arteriosclerosis shows less improvement with this method of treatment than the other two types of arterial insufficiency. The patchy type of arteriosclerosis shows greater improvement under this treatment than the more uniform type. Patients who are of middle age or older and in whom an incipient arteriosclerotic gangrene is evident in the extremities should not be treated by diathermy if their tolerance is down to or below 40 per cent of normal. In such cases the gangrenous process develops at a more rapid rate than can be counteracted by diathermy treatment.

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THE PROGNOSTIC VALUE OF THE COLD TEST IN PREGNANCY*

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SUFFICIENT evidence has accumulated to establish the validity of the cold test in clinical medicine.^{1,2} To date its use has been largely of academic interest, but gradually it is assuming a rôle of importance in actual clinical work. Because of the apparent ability of the cold test to determine vasomotor irritability, its use has been limited to the study of hypertension, and as a result significant data have been obtained to suggest that the test can determine prehypertensive constitutional defects.^{1,2,3}

Inasmuch as some of the eclampsias represent a hypertensive phenomenon, it was felt that the cold test could prove of importance in the prenatal period. It was realized that it would only be of value in the early recognition of prehypertensive types, and that toxemic states other than those of a hypertensive nature, could not be recognized by the test. Eclampsia as a result of nephritis has a different physiological basis than

eclampsia arising from a hypertensive constitutional defect. In our experience, toxemia of pregnancy due to essential hypertension was a reversible process, until repeated vasomotor insults established a permanent hypertension. Despite the reversible feature of the process, the toxemic state is of a serious nature and often demands heroic treatment to alleviate the condition. If it were possible to establish the existence of latent hypertension in pregnant women, the prenatal care could be adjusted so as to easily recognize the person predestined to hypertension by her vasomotor responses. Thus forewarned, ample time would be had to administer properly therapeutic measures to relieve or ameliorate the condition.

With this in mind a study was undertaken at the Ancker Hospital to determine the vasomotor responses of pregnant women to the stimulus of cold. The patients were not selected, nor was any attempt made to segregate them into

*From the medical service of Ancker Hospital.

early or late pregnancy. The cold test was performed in the usual manner and then the patient followed through until the end of pregnancy. Wherever possible, an attempt was made to discover the existence of hypertension in the maternal parents. It was assumed that hypertension existed in those instances where parental deaths occurred suddenly in middle life as a result of either cardiac or cerebral accidents. As a result of this study, the following data were obtained.

The cold test was applied to 233 consecutive patients entering the prenatal clinic. Of this group 137 patients were multiparas and ninety-six were primiparas. The ages varied from sixteen to forty years, with the largest number of patients falling in the group twenty-two to twenty-eight years. There were ten colored women in the group, and all the patients belonged to the welfare class.

From a study of the family history it was found that ten patients had both a maternal and paternal hypertensive background. In these cases, the existence of parental hypertension was corroborated by clinical examination. Forty-four patients gave histories wherein one or the other parent suffered from hypertension. It was in this group that cardiac and cerebral accidents were assumed to be of hypertensive origin; it was of course recognized that such an assumption is liable to wide error.

At the time of the cold test study, thirty patients were in the ninth month of pregnancy; ninety were in the eighth month of pregnancy; forty-eight were in the seventh month of pregnancy; twenty-five were in the sixth month of pregnancy; ten were in the fifth month of pregnancy; fifteen were in the fourth month of pregnancy and fifteen were in the third month of pregnancy. There were no instances of pregnancy earlier than the third month. In no instance could we find any influence of the length of pregnancy on the cold test response. The reactions were identical to those obtained in non-pregnant groups. In this series we determined to group them as to their family history of hypertension.

In the group without familial hypertension, only two patients were found to give an exaggerated response. In those instances where one or the other parent was hypertensive, twenty-one

were normal reactors, ten were hypo-reactors, and thirteen were hyper-reactors. Of ten patients who gave a familial history of hypertension in both parents, all gave a hyper-reactor response.

At the end of delivery only two individuals in the normal reactor group were found to be toxemic. The toxemia in these instances was due to an underlying chronic glomerulo-nephritis. No other individual in the normal reactor or hypo-reactor group gave evidence of toxemia that could be related to essential hypertension.

The hyper-reactors in the group wherein no familial history of hypertension was obtained, showed no evidence of toxemia at the end of pregnancy.

Of the thirteen hyper-reactors giving a history of hypertension in one or the other parent, ten had normal blood pressures when delivered. The remaining three came to term with elevated blood pressures and one with signs of toxemia.

Mrs. J., aged thirty, gravida II, normal delivery. Cold test at seven months: blood pressure 122/78, 156/106, 150/100, 140/94, 132/80. Blood pressure at eight months 174/100. Blood pressure at nine months 188/100. Urine, albumin plus one. No other signs of toxemia. Blood pressure at one month postpartum 136/80.

Mrs. A., aged twenty-seven, gravida III, spontaneous delivery. Cold test at seven months: blood pressure 116/74, 142/94, 142/90, 136/90, 140/80. Blood pressure at the end of the eighth month, 156/100. Blood pressure at the end of pregnancy, 166/100. No other signs of toxemia. Urine negative. Blood pressure two weeks postpartum 118/76.

Mrs. T., aged twenty-four, gravida III, spontaneous delivery. Cold test at sixth month: blood pressure 116/60, 142/80, 156/84, 150/80, 148/92. Blood pressure was normal until eighth month when it rose to 180/110 and remained at this point until labor occurred. Patient developed headaches, scotomata and scanty urination. The eye grounds showed Grade I vasospastic arterioles. Edema Grade II. Urine revealed albumin three plus. At one week postpartum blood pressure was 126/80.

In the group where both parents suffered from hypertension, all the patients were hyper-reactors and nine of the ten individuals comprising the group showed definite alterations from normal at the end of gestation.

Mrs. N., aged twenty-one, gravida II, spontaneous delivery. Cold test at fourth month of pregnancy: blood pressure 140/90, 164/110, 146/110, 136/76, 140/98. Blood pressure gradually rose to 185/110 at the end of the ninth month. Urine revealed four plus albumin. Edema

was generalized. The eye grounds revealed arteriolar spasm. The patient was treated as a pre-eclamptic and carried through to term. Blood pressure one week postpartum was 136/80.

Mrs. P., aged twenty-eight, gravida II, delivered by cesarean section. Cold test at seventh month: blood pressure 140/96, 162/100, 142/100, 148/100, 148/100. Blood pressure rose rapidly to 225/100 at the 9th month of pregnancy. Urine, albumin four plus. Edema three plus. The eye grounds revealed severe arteriolar spasm with edema of discs and retinitis. Blood pressure at two weeks postpartum was 150/80.

Mrs. J., aged forty-seven, gravida II, spontaneous delivery. Cold test done at the eighth month: blood pressure 130/64, 140/72, 150/72, 146/70, 144/70. The blood pressure at the ninth month had risen to 168/98. There were no signs of toxemia. Blood pressure two weeks postpartum was 142/70.

Mrs. C., aged thirty-eight, gravida X. Fully developed eclampsia treated by Stroganoff method. Cold test blood pressure 148/94, 168/94, 144/90, 146/90, 146/90. Blood pressure increased at the eighth month and finally reached 220/100 at the ninth month. Patient had a fully developed toxemia, suffering from convulsive seizures despite Stroganoff regime. Dead fetus was delivered two weeks before term. Last two pregnancies were marked by eclamptic phenomena. Eight weeks postpartum blood pressure was 146/90.

Mrs. H., aged twenty-five, gravida I, spontaneous delivery. Cold test at six months: blood pressure 108/76, 126/90, 120/80, 124/84. Blood pressure remained within normal limits until end of the eighth month; a gradual elevation occurred in pressure until it reached 178/110. No signs of toxemia. Blood pressure one week postpartum was 138/80.

Mrs. W., aged twenty-seven, gravida II, premature spontaneous delivery at the eighth month. Cold test at fourth month: blood pressure 140/80, 156/80, 160/90, 152/80, 150/80. Blood pressure rose until the eighth month when it reached 170/110. Urine albumin four plus. Edema grade II. Spots before eyes. One week postpartum blood pressure was 145/80.

Mrs. C., aged twenty-six, gravida I, spontaneous delivery. Cold test at sixth month: blood pressure 132/86, 148/82, 164/90, 150/70, 144/90. Blood pressure underwent gradual increase until the ninth month when it reached 180/100. Urine, albumin four plus. Edema grade II. Eye grounds revealed moderate vaso-spasm. One week postpartum blood pressure was 145/80.

Mrs. H., aged twenty-four, gravida II, spontaneous delivery. Cold test at seventh month: blood pressure 140/90, 160/108, 152/100, 148/96, 146/100. Blood pressure rose suddenly in last half of the 9th month reaching 170/120. No other signs of toxemia.

Mrs. P., aged twenty-eight, gravida II, spontaneous delivery. Stroganoff treatment. Cold test at eighth month: blood pressure 128/78, 146/96, 136/98, 126/84, 130/86. Blood pressure suddenly rose to 200/120. Fully developed eclampsia, having one convulsion prepartum.

Summary

Cold tests were done on 233 consecutive routine prenatal patients. As a result of this test, it was found that

1. Only two hyper-reactors were found in the group with no familial history of hypertension.
2. In those instances where one or the other parent had hypertension, the offspring gave hypotnormal, normal, or hyper-reactions.
3. The offspring of pure hypertensive families always gave hyper-reactions.
4. No cases of toxemia of pregnancy that were of hypertensive origin occurred in the normal reactor group. Toxemia of nephritic origin did occur twice in the normal group.
5. Three cases of hypertensive toxemia with reversal of blood pressure to normal occurred in the one parent hypertensive series.
6. Nine cases of hypertension and hypertensive toxemia occurred in the pure familial hypertensive series.
7. Of the combined hyper-reactor groups only eleven patients escaped elevated blood pressure at the end of gestation.

Conclusion

Realizing the inadequacy of the number of cases studied, no definite conclusions can be drawn except to suggest that toxemia occurring upon a hypertensive background may be predetermined by means of the cold test.

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USE OF ZINC PROTAMINE-INSULIN IN DIABETES MELLITUS

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SINCE the published reports of cases of diabetes mellitus treated with protamine-insulin are few, it has seemed worth while to add to the data available a report of a case which offered an unusual problem.

The patient was an Aryan male, thirty-three years old, married, and having one son of eleven years. There was nothing worth notice in the family or personal history. At the age of twenty-eight the classic symptoms occurred and a diagnosis of diabetes mellitus was made. The usual treatment by diet and insulin was instituted, and the patient did fairly well for six years. Then an exacerbation occurred, which was combated successfully; however, the diabetes now proved much more difficult to control. The pancreatic function was highly variable and always greatly impaired, and a balanced diet which contained 110 grams of carbohydrate permitted wide oscillations from 180 mg. per cent in the blood-sugar ratio. This was a bare maintenance diet and had to be balanced by 42 units of insulin in the morning and 20 at night. Considering the magnitude of these doses, the therapeutic margin was very narrow; mild coma or mild shock could not always be averted. In addition to this, the patient became frightened. He had been taught to increase the dose of insulin during periods of excitement, fatigue, respiratory infections, et cetera, or when he violated his diet, but now he fell into the habit of increasing it whenever he became apprehensive. He seemed to be possessed of a clinging fear of diabetic coma, to escape which he fled into what he conceived to be the lesser evil, insulin shock. In spite of all that could be done to emphasize the fact that insulin is a potent drug, and that great caution should be exercised in increasing the dose, he would follow the least violation of his diet, the least exertion, the slightest catarrh of the nose, with six or eight additional units—too large an increment—and promptly go off into a condition of shock from which it became increasingly difficult to arouse him.

This state of affairs had continued for about two years when, upon a festive occasion in which loss of sleep, excitement, a very hot summer evening, and a violation of his diet were involved at once, he gave himself such a dose of insulin that three days of treatment in the hospital was necessary just to restore him to consciousness. After this episode he was kept in the hospital for six weeks in order that an entirely new regime might be instituted to terminate the unsatisfactory state of affairs which had existed before. New studies were made of the urine and blood, a new diet was devised, and a new kind of treatment was begun in the use of protamine-insulin. During the last two weeks of this period of reorganization the patient was allowed to go out whenever he pleased, being required to report to the hospital only for meals and at night. When finally he was permitted to return home it was found that a maintenance diet needed the addition of 44 units of protamine-insulin in the morning and 28 in the eve-

ning. This regime had proved entirely satisfactory for a month, and had not needed to be altered.

But at three o'clock, the second night after he had returned home, he was found in a state of severe insulin shock. He was roused from this by repeated doses of orange juice and sugar administered, with extreme difficulty, by his wife. He felt well enough during the day, but toward six o'clock in the evening he went into mild shock. He was given orange juice and candy, and was restored without difficulty.

His condition at this time is illustrated graphically in Chart 1. It was evident that the diet-insulin ratio which had been worked out so painstakingly and had proved so satisfactory would not apply to his home conditions. He was getting too much protamine-insulin, and it was thought—erroneously—that some pancreatic function was being revived. Indeed, the insulin shocks seemed encouraging. The dose of protamine-insulin was reduced as judiciously as possible, the diet remaining fixed, until the condition shown in Chart 2 was attained. The morning dose could not be reduced below 36 units without the appearance of glycosuria during the day, and this caused the patient to lose weight at once. The evening dose was halved, but the patient still had his insulin shock every morning, although at a later hour and with less severity. It was never possible entirely to prevent this early morning shock by administering less insulin or postponing the evening meal; the only way in which it could be averted was to have the patient set his alarm for two o'clock, get up, and take some orange juice and candy. The loss of sleep which this caused soon told on his general condition. Lessening either the morning or the evening dose of insulin, or both, caused a severe glycosuria during the day without averting the early morning shock; increasing either or both doses caused the glycosuria to disappear, but required that the patient get up in the middle of the night to eat carbohydrate or else suffer a severe shock early in the morning. After endeavoring fruitfully for two months to adjust the treatment to the patient, during which time he lost as much as 110 grams of sugar during twenty-four hours and, quite naturally, suffered from insulin shock during the same period, the protamine-insulin was given up and regular insulin used again.

It is evident that in this case the action of protamine-insulin was too evenly protracted to be successful in treatment. When the excess carbohydrate in the blood was used up during the day, either by metabolism or by excretion, hypoglycemia occurred during the night while the insulin was still active, and this brought the patient into shock. The patient's pancreatic function was nearly or quite zero. Ingestion of carbohydrate foods was followed by a rapid and great rise in his blood-sugar, and a sufficient quantity of rapidly available insulin was needed at once. It seems quite possible

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that if he had had some residual pancreatic function, the daily or twice-daily injection of protamine-insulin might well have been successful, for the pancreas would have taken care of the sudden changes which occur

the pancreatic function was about zero), and the patient would lose carbohydrate which he needed to sustain life itself, and at the same time render himself liable to shock subsequently.

ESTIMATED FLUCTUATIONS OF BLOOD SUGAR

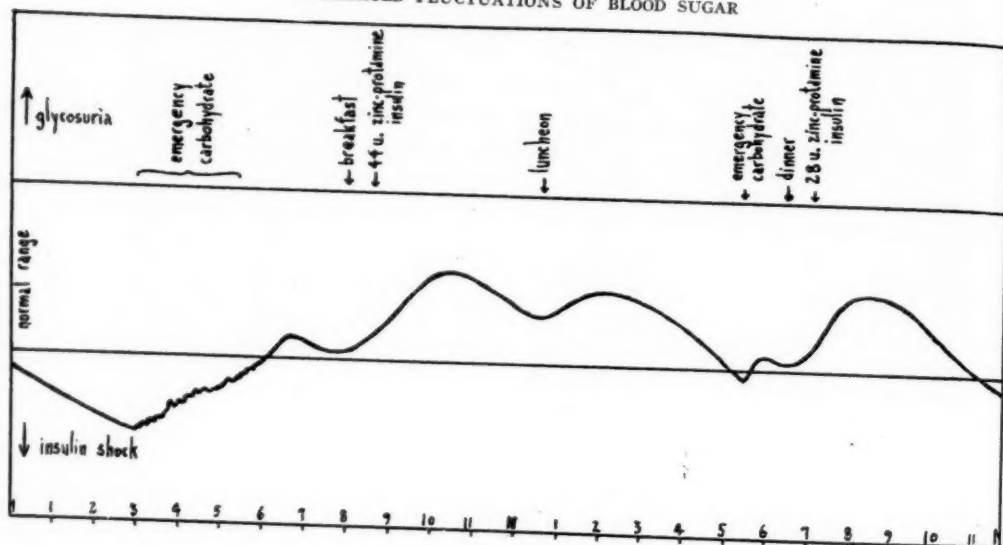


Chart 1.

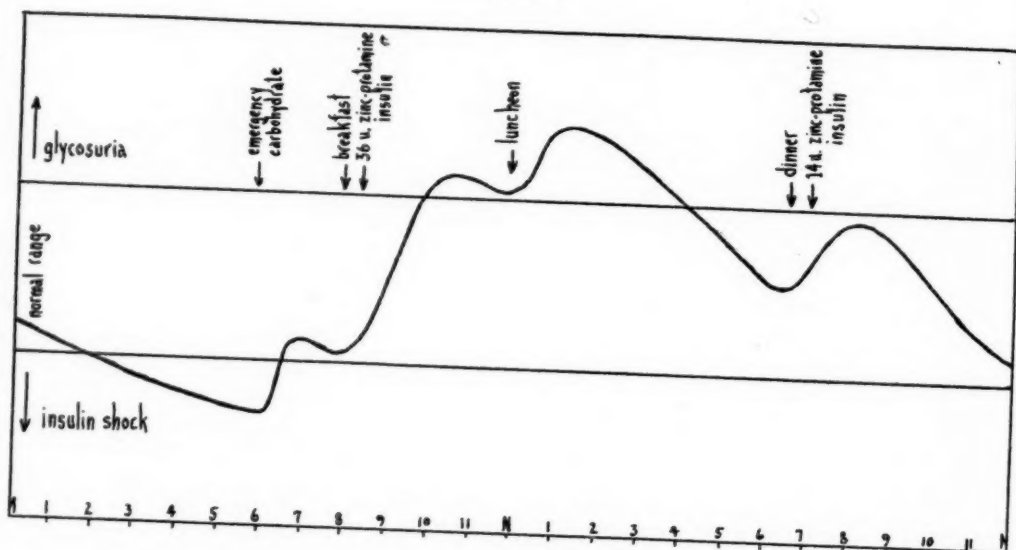


Chart 2.

after eating. In this case, however, so much protamine-insulin was required to take care of the quantities of carbohydrate ingested at meals that the continued slow action of the insulin after the meal period (i.e., daytime) produced hypoglycemia. And if less of the slowly acting insulin were given, the hyperglycemia which occurs after eating would not be offset (since

Campbell, Fletcher, and Kerr have suggested six means of controlling this postprandial hyperglycemia. None of these was successful. Increasing the dose of protamine-insulin only aggravated the early morning shock. Moving back the injection time had no noticeable effect whatever. Reconstituting the diet so that most of the carbohydrate was given at night only pro-

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duced a hyperglycemia after the evening meal without in any way altering the early morning shock. The fourth suggestion, like the sixth, involves the use of regular insulin with protamine-insulin, and no advantage could be seen in the use of two remedies to take the place of one. And giving a second dose of protamine-insulin, a few hours after the morning one, while it reduced the hyperglycemia, increased the intensity of the early morning shock.

But the purpose of therapeutics is not merely to delight the laboratory scientist with a series of twenty-four hourly specimens of blood each containing 165 milligrams per cent of sugar. It is first of all to make the life of the patient safe, and to keep himself, his family, and his friends as happy as possible. In this case both the patient and his wife lived in continuous apprehension of the early morning insulin shock and the peril of diabetic coma during the early afternoon. The rising at two o'clock in the morning to test the urine and eat brought on a state, particularly in the wife, approaching exhaustion. His friends, too, were deeply concerned over the gravity of his condition and

the absence of success in treating it. Under these conditions the old regime was resumed, for in spite of its shortcomings it had proved better than the new.

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LEIOMYOMA OF THE STOMACH ASSOCIATED WITH MALIGNANT GASTRIC POLYP*

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THE unusual pathologic changes in the tissues of the body which are occasionally encountered are interesting not only because of their rarity, but also because intriguing diagnostic problems are often involved. In such cases accurate diagnosis is vital to the patient's physical and mental health. This is particularly true when the lesion is obviously present as a readily palpable tumor, yet if it is located in the abdomen its nature may be clothed in mystery until it is exposed at the operating table or, in some cases, until part or all of it reaches the pathologist. Roentgenologic studies often clear the way toward the imperative accurate diagnosis. In rare conditions complete preoperative data carefully evaluated may not lead to an accurate diagnosis because the limited past experience does not permit accurate judgment. The present case is reported because of the infrequency with which such lesions occur and the diagnostic problem involved.

The patient, a woman forty years old, first came to the clinic in 1928, only because of an asthmatic bronchitis. Our efforts at that time were confined to that condition, for all her other bodily functions were normal. On the patient's second visit to the clinic, in 1931, she complained of constipation, of headaches of a migrainous nature, and of an uncomfortable feeling in her abdomen which was associated with some bloating, flatulency and belching after the ingestion of fats. There was no history of abdominal pain, soreness, jaun-

dice, or other suggestive symptoms of cholecystic or gastric disease. Elsewhere she had been advised of an existing anacidity, a condition whose presence was confirmed by us. Roentgenologic examination of her abdominal organs was not made at this time. Paroxysmal tachycardia was present, but physical examination gave negative results except for small uterine fibroids which were discovered on bimanual examination.

At the time of this patient's third visit to the clinic, in 1932, she sought an explanation for an enlarging abdomen; she thought that she could feel a small tumor adjacent to the umbilicus. This, however, we could not palpate. She had gained 13 pounds (5.9 kg.) since the time of her last visit. Aside from the fibroid previously noted, physical examination at this time was negative and the routine laboratory findings were normal. No roentgenologic study of the abdominal organs was made.

In 1935, the patient again visited the clinic, at which time she was forty-eight years old. She had reached the menopause in January, 1931. She again complained of an abdominal mass, which she said she could feel and which she said she was conscious of when supine because of the weighty feeling in her abdomen and because of her periumbilical cramps. There were no symptoms to suggest the possible origin or nature of this mass, there was no pain after meals, nausea, vomiting, or gross bleeding from the gastro-intestinal tract. The patient maintained the tumor had grown from the time she had first been able to feel it in 1932. She was an ardent golfer and led an active, robust athletic life. The constipation of which she formerly complained was less troublesome at this time, and only rarely did she have palpitation or cardiac irregularity.

On physical examination the patient appeared to be in radiant health, with good musculature and tanned

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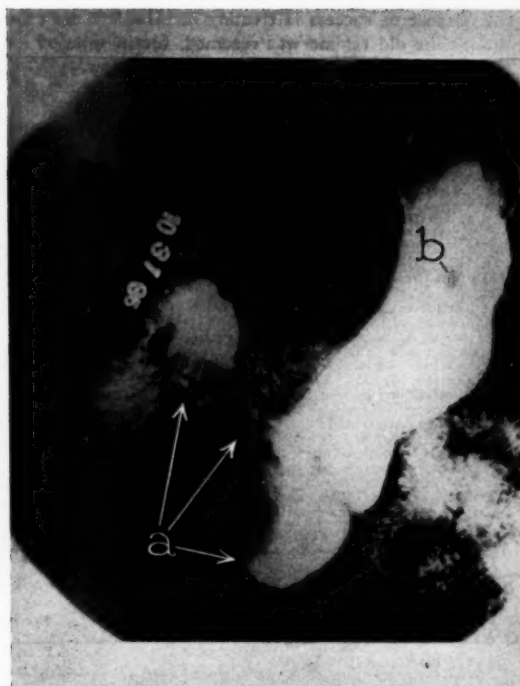


Fig. 1. Roentgenogram of stomach, revealing (a) filling defect produced by larger intramural leiomyoma involving greater curvature; (b) filling defect produced by a small pedunculated gastric polyp which proved to be malignant on histologic examination.



Fig. 2. Gross specimen, showing broad base of pedunculated leiomyoma attached to external surface of stomach. The upper portion of the specimen has been rotated to expose the mucosal surface, to which is attached a pedunculated malignant gastric polyp p.

skin. Her weight had remained constant at 128 pounds (58.1 kg.). She was five feet five and a half inches (166 cm.) tall; her blood pressure in millimeters of mercury was 118 systolic and 78 diastolic, and her heart, lungs and pelvis, except for fibroids, were pronounced negative. Palpation of the abdomen at this time revealed a firm tumor, about 10 by 5 cm., and somewhat the shape of a palpable spleen which had rotated 180° on its anteroposterior axis, so that a niche like a distorted splenic niche was near the left costal margin. The mass could be moved with ease to any place in the abdomen, even to the right lower quadrant, without discomfort to the patient, and could actually be turned to some extent on either of its axes.

In the differential diagnosis the following conditions were considered: wandering spleen, enlarged loose kidney, mesenteric tumor, intestinal tumor, and gastric tumor. While the size and position of the tumor hinted that it might be the spleen, the niche was poorly defined and was located on the opposite side of the mass from the usual site of a splenic niche. The value for hemoglobin was 16.4 gm. per 100 c.c. (98 per cent); erythrocytes numbered 4,440,000 and leukocytes 9,200 per cubic millimeter. The differential blood count revealed the following percentages: lymphocytes 34.5, monocytes 2.0, neutrophils 61.5, eosinophils 1.0, and basophils 1.0. Blood smears showed nothing diagnostic. The mass, therefore, could hardly be the spleen. When in its usual position at the left costal arch, to which the mass would settle if left alone, it was not palpable posteriorly by bimanual palpation, as is possible with the kidney, particularly when enlarged. The urine had a specific gravity of 1.029; it was acid in reaction and contained no albumin or sugar, but a few pus cells were present. The blood urea was 28 mg. per 100 c.c.

A roentgenogram of the kidneys showed them to be of normal size and in normal position, but revealed an irregularly shaped soft tissue shadow about 12 cm. in diameter overlying and extending below the left kidney. This definitely excluded, of course, the possibility of renal tumor. Primary mesenteric tumors of this size, on the other hand, are usually cystic and globular and do not migrate to the left costal margin. They tend to be midabdominal. The tumor in this case did not conform to these requirements, and so the possibility of mesenteric tumor was also abandoned. A tumor of the colon of this size would have produced some obstructive symptoms, but the patient's constipation had improved. A roentgenogram revealed the colon to be normal and the tumor to be extrinsic to the bowel. No attempt was made to connect the tumor with the small bowel by roentgenologic study, which might have been necessary had not roentgenologic study of the stomach disclosed the true location of the tumor.

Roentgenologic examination of the stomach revealed an irregularly rounded filling defect involving the greater curvature of the lower third of the stomach. The filling defect coincided with the palpable tumor, although it was quite apparent that the tumor was much larger than could be accounted for by the defect in the contour of the stomach. It was impossible to separate the tumor from the stomach and both moved together when the mass was shifted in the abdomen. Pressure of the palpating hand on the lower half of the stomach revealed that the outline of the gastric mucosa was intact, although it was pushed upward at the site of the tumor. This fact made it quite evident that we were dealing either with a tumor that had arisen within the gastric wall and had deformed the gastric mucosa secondarily by pressure, or a tumor that was firmly at-

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Fig. 3. Leiomyoma of stomach (X 255).

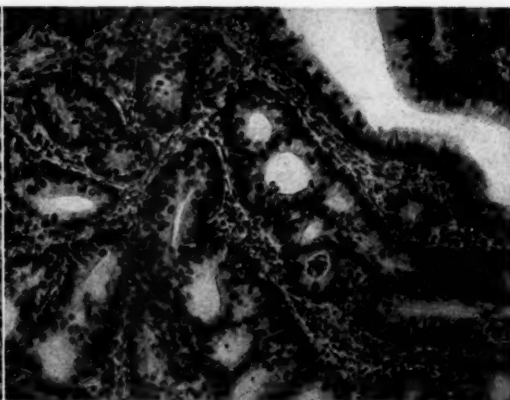


Fig. 4. Malignant polyp of stomach (X 175).

tached to the stomach itself. In addition to this lesion, roentgenoscopy revealed a discrete polypoid lesion of the mucosa, about 1.5 cm. in diameter, on the posterior wall at about the junction of the upper and middle thirds of the stomach. It had the usual appearance of a gastric polyp (Fig. 1).

Exploration through a midline incision revealed a large, pedunculated, and irregularly shaped polypoid tumor, 11 cm. in diameter, attached to the external surface of the stomach near the angle anterior to the gastrocolic omentum. The base of this tumor was 2.5 cm. in diameter. In addition, the stomach contained a polypoid mass, 3 cm. in diameter, which was attached to the mucosa of the posterior wall in the upper midportion of the stomach. Further exploration showed a few small uterine fibroids. The appendix was not visualized. Partial gastrectomy was performed, removing three-fifths of the stomach and reestablishing gastric continuity by means of a posterior Polya type of anastomosis.

Attached to the 15 cm. of stomach which had been removed was a leiomyoma, 11 cm. in diameter, on the serosal side. The mucous membrane was not involved by the growth. There was also a carcinomatous polyp, 3 cm. in diameter, on the mucosal side of the specimen. No adjacent glands were attached to the specimen (Figs. 2, 3 and 4).

Comment

Leiomyoma is the most common tumor of the stomach. This startling statement is clarified, however, by adding that all but a few of such tumors are of microscopic proportions and never grow to the size reported by Zellhoeffer and Rieniets. The finding of a leiomyoma of the stomach of surgical importance, therefore, is rare.

The literature on this subject is quite considerable in English, French and German. Eusterman and Senty, in 1922, reported from The Mayo Clinic twenty-seven benign tumors of the stomach in 2,168 operative and 2,285 nonoperative cases of gastric tumor. Of these twenty-seven benign tumors, ten were myomas, five fibromas, four angiomas, two dermoids, one gastric polyposis, two adenomas, and three polyps. Wells, reporting a case of leiomyoma with fatal termination, quoted Naidu and MacCarty, who reported 1,194 cases of tumor of the stomach in which patients were operated on. Fifteen lesions were benign; five were leiomyomas, three fibro-

mas, two fibromyomas, one adenoleiomyoma. Farr and Glenn listed eighty-four myomas reported from 1896 to 1912 and said they had never heard of a case in which the diagnosis was made preoperatively. That probably holds true today except that, with improved roentgenologic technic, it is generally possible to differentiate a malignant from a benign gastric tumor.

Historical data aid little, if at all. Leiomyomas of surgical importance affect no particular age group. Outland and Clendening reported a hemorrhagic leiomyoma, weighing 341 gm. and measuring 8 by 6 cm., in the case of a nine-year-old boy. According to Hunt most of these tumors occur between the ages of forty and seventy years. Benign tumors are usually asymptomatic, although hemorrhages may occur. In the case reported, this was not true and the mucous membrane was found intact. When properly placed, the tumors may cause obstruction to the gastric outlet. Aside from hemorrhage and obstruction, no symptoms occur with any regularity. The patient in the present case reported that when supine she had a sense of weight in her abdomen and periumbilical cramps, which was indicative of mild obstruction of the small bowel. Nutrition is not interfered with and dyspepsias usually do not occur even if the tumefaction is large. Surgical removal effects cure and is the only treatment of avail.

This report, which was written fifteen months after the operation, finds the patient again able to enjoy her active, athletic robust life.

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EDITORIAL

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BUSINESS MANAGER

J. R. BRUCE

Volume 20, JUNE, 1937 Number 6

State Medical Meeting, 1937

THE 84th annual meeting of our State Medical Association is now a matter of history. The meeting this year set a high mark in attendance and interest, the innovation this year being the inclusion in the program of the other professions allied with medicine in the care of the sick. This is the first time in this locality at least that a state medical meeting has included on its program representatives of dentistry, nursing, pharmacy, hospital administration and social welfare service. When we consider that there are only about 150,000 physicians in the country and some million additional individuals who devote their activities to the care of the sick directly or indirectly, it seems highly proper that advantage should have been taken of the recent

medical meeting to consider matters of common interest with these groups.

The meetings of the Congress of Allied Professions were of a distinctly economic nature. One afternoon was devoted to addresses on social service, hospital associations, nursing education, and problems of dentistry and pharmacy with informal discussions by representatives of various groups mentioned. Such meetings should lead to understanding and coöperation among these allied groups in facing important problems which have been intensified by the depression and concerning which so much legislation has been enacted. Interest in these problems was demonstrated by the large number of individuals attending the Congress (see Medical Economics section).

The official registration at the combined meeting was 5,510. Of these 3,140 were physicians. Some fourteen states were represented although the states bordering on Minnesota contributed most of the out-of-state visitors. The program the last day of the convention, devoted to industrial injuries, attracted many and was the occasion of a gathering of the Great Northern Railway surgeons.

Industrial surgery and the care of injuries from automobile accidents involving insurance, have come to play a very large part in surgical practice. In this type of work the relation of the patient in his choice of surgeon has been rather disturbed and we take pleasure in publishing in this issue an address on the subject by Mr. Voyta Wrabetz, Chairman of the Industrial Commission of Wisconsin, which contains much valuable advice to the profession. The physician's prime consideration in these cases is still for the patient, although the patient does not foot the bill. The author stresses the necessity for the same psychological treatment of the patient that applies to the so-called private patient, a point which is perhaps too often overlooked.

Some fourteen distinguished guest speakers took part in the program. Unfortunately two expected guests, the Reverend Alphonse M. Schmitalla of St. Louis, and Dr. Morris Fish-

MINNESOTA MEDICINE

bein of Chicago, were unable to attend. The addresses of the attending guests will appear in MINNESOTA MEDICINE in succeeding issues, and should prove interesting reading to those who were unable to attend the convention.

The evening meeting of the Congress held at the Auditorium was well attended, which showed the interest in economic problems on the part of the allied groups.

The Auditorium was nearly filled for the Public Health meeting, which indicated the general interest on the part of the public in health matters. The coöperation of newspapers and radio stations resulted in widespread publicity which doubtless did much to contribute to the success of this phase of the meeting, an accomplishment which should be a source of pride to each member of the Association and which does credit to the officers and local committees.

The medal offered each year by the Southern Minnesota Medical Association for the best scientific exhibit was awarded this year to Dr. Edward A. Boyden and his associates for his studies on the gallbladder and sphincter of Oddi. Those receiving honorable mention were Dr. L. F. Hawkinson of Brainerd for his endocrine studies, and Dr. Horace Newhart of Minneapolis for his committee's exhibit on deafness prevention and amelioration.

The work of the House of Delegates was handled expeditiously by means of reference committees. It was unfortunate that one meeting prevented delegates from attending scientific sessions. The delegates had the pleasure of hearing Olin West, our national secretary, who made the plea that the medical profession be left free to continue its marvelous progress and not be throttled with any national sickness insurance which would result in inferior medical care to the public. Dr. West mentioned the publicity campaign of the United States Public Service for the control of syphilis. The Council of the State Association has passed a resolution urging coöperation of the profession with federal and state agencies in the war on venereal diseases. It is their recommendation that federal and state aid be given existing agencies where needed rather than for the purpose of establishing new clinics for the diagnosis and treatment of these diseases, any new clinics to be established by local county societies. The delegates also heard

from Dr. E. H. Skinner of Kansas City, about some of the steps taken by the profession in that city to meet social security problems. In Kansas City no free vaccination is done except at the City Hospital and the immunization is done at a set fee of one dollar in the doctors' offices. He called attention to the fact that panel medicine has not proven itself superior in cutting down disease and disability in those countries where it has been tried.

The new constitution of the state medical association was adopted by the House of Delegates and two new officers, speaker and vice-speaker of the House, were added.

The following were elected officers of the Association for 1938: Dr. James M. Hayes, Minneapolis, president; Dr. W. R. McCarthy, Saint Paul, first vice-president; Dr. B. A. Smith, Crosby, second vice-president; Dr. E. A. Meyerding, Saint Paul, secretary; Dr. W. H. Condit, Minneapolis, treasurer; Dr. W. W. Will, Bertha, speaker of the House of Delegates; Dr. J. C. Hultkrans, Saint Paul, vice-speaker of the House of Delegates.

The following Councilors were elected: Dr. B. J. Branton, Willmar, Third District; Dr. G. A. Earl, Saint Paul, Fifth District; Dr. Chester A. Stewart, Minneapolis, Sixth District; Dr. E. J. Simon, Swanville, Seventh District.

Dr. J. T. Christison, Saint Paul, was re-elected delegate to the A. M. A. meeting, with Dr. E. A. Meyerding, Saint Paul, as alternate.

The State meeting next year will be held in Duluth at a date to be set later by the Council.

Coramine

IN SPITE of much reference to stimulants, we have as a matter of fact very few at our disposal. Strychnine has been given from time immemorial only to have almost entirely disappeared in this connection. Camphor is little used in this country, although it is said to be used considerably in European countries. Caffein is much used but has the well known effect of producing sleeplessness and is now known to add to the cardiac depression caused by acetanilid, alcohol and morphine. Ephedrine has been disappointing as a stimulant and if given intravenously is actually dangerous. Digitalis is slow in ac-

tion and its use intravenously and in pneumonia is certainly open to question.

Most of the literature regarding pyridine beta carbonic acid diethylamide, more generally known as coramine, has appeared in foreign countries. A number of articles, however, have been published in recent years in this country which indicate that coramine is a valuable synthetic drug not only because of its action in stimulating respiration, but because of its circulatory action. Its stimulation of the central nervous, more especially the respiratory center, has been well proven. Recently it has been shown that it increases ventricular contraction, rate of blood flow generally and in the coronary vessels particularly, and in some cases at least elevation of blood pressure. Electrocardiographic studies following its administration show an increased electrical voltage in the ventricular complex without depression of the atrioventricular conductivity.

Coramine is of particular value in overcoming the depression caused by such drugs as the barbiturates, anesthetics, alcohol and morphine. One author reports its routine use following avertin anesthesia and in a few instances a life saver when given intravenously with simultaneous intramuscular injections in such cases. Another author gives it in twenty minim doses orally every four hours as soon as the diagnosis of pneumonia is made, and finds it assists respiration and prevents cyanosis. When the patient is seen late and cyanosis is already marked, one to three cubic centimeters of coramine given intramuscularly often causes the cyanosis to disappear. Its circulatory action has also proved of benefit in myocardial and valvular heart disease associated with decompensation.

The reports from the clinical use of coramine are most convincing. It can be used orally in twenty minim doses of the 25 per cent solution as often as every four hours for an indefinite period or subcutaneously or intramuscularly in two to five cubic centimeter doses or even intravenously in similar dosage. Its synergistic action with digitalis and strophanthus should be allowed for. The wide latitude between its therapeutic and toxic dosage renders coramine a particularly safe drug.

Painting the Orange

Today the orange is universally recognized as a rich source of vitamin C and therefore a desirable fruit for children. The natural color and other characteristics of the rind vary with different varieties and with the season. Once these features served to some extent as marks of identification. This is not true today, when there is a current tendency to "improve on nature." Several years ago the practice of exposing oranges to ethylene gas for from two to four days was introduced. The ethylene causes a blanching of the green color and a consequent unmasking of the yellow pigments also present in the skin. The United States Department of Agriculture has ruled that this process does not itself constitute adulteration. More recently a rapid method of coloring has been employed. The fruit is dipped in a solution of a harmless coal tar dye, which gives to the resulting "painted oranges" a more uniform, brilliant color. Food laws require that the presence of dyes must be declared by having the phrase "color added" stamped on each orange. The state of Florida has recently provided rigid regulation of the packaging and marketing of citrus fruit according to more exacting standards than those required by the federal government. The United States Department of Agriculture accordingly has agreed to wait until September, 1937, before action will be taken on fruit shipped in interstate commerce. The Florida regulations in large measure should serve to remove the necessity for federal action. Accurate information concerning the effect of the artificial coloring of oranges on the consumption of the fruit is not available. Consumers have questioned whether the colored oranges are of high quality. Some consumers have expressed the opinion that colored oranges do not keep as well as the untreated russet colored fruit. Others have asked whether the "painted" rind is suitable for making marmalade and candied orange peel. The promulgators of the coloring of oranges should arrange to answer these questions by scientific evidence. (J. A. M. A., Dec. 26, 1936, p. 2136).

Mercurial Diuretics

Sollmann and Schreiber studied in a routine manner the excretion of mercury in clinical treatment and recorded the urinary volume. The different preparations were given by intravenous or intramuscular injections. They were classified into four groups: the organic compounds, including mercurous, merbaphen and salyrgan; the inorganic ionizable compounds, including mercuric bromide, mercury bichloride in oil and mercuric oxydine; the inorganic colloidal compounds, consisting of metallic mercury and mercuric sulfide; and the unclassified compounds flumerin and mercuric salicylate in oil suspension. The organic compounds caused somewhat greater diuresis in therapeutic doses, but with regard to the mercury content and especially the amount of mercury excreted the organic compounds were surpassed both by ionizable inorganic and by colloidal compounds. Furthermore, the organic compounds gave somewhat more prolonged periods of diuresis and excretion of mercury than the inorganic compounds injected both by vein and by muscle. The colloidal compounds caused the shortest period of diuresis when injected by vein and the longest period of excretion of mercury when injected intramuscularly. They caused the longest period of diuresis and the shortest period of excretion of mercury. In general, the differences between the compounds of each group were minor and do not suggest a significant generalization. (J. A. M. A., Feb. 27, 1937, p. 730.)

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association

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Approved by the Delegates

A brief résumé of the entire proceedings of the House of Delegates and Council at their recent Saint Paul sessions will be published in an early issue of MINNESOTA MEDICINE.

In the meantime, here are some of the more important actions taken by both bodies at the Saint Paul session. They concern affairs of public moment and all members should be aware of their purpose and content.

Resolution on Syphilis

A resolution on syphilis which is a modification of the report offered to the House by the new Committee on Syphilis and Social Diseases was passed by the Delegates and now constitutes the official policy of the state association on the campaign for syphilis control in Minnesota. Here it is, complete.

"It is the consensus of opinion of the Council of the Minnesota State Medical Association that the medical profession of the State of Minnesota shall co-operate with the United States Public Health Service, the Minnesota State Board of Health and the various local and municipal boards of health in the national and state programs for the control of venereal diseases.

"It is recommended that uniform standards of examination and treatment be established on a state-wide basis under the direction of the Committee on Syphilis and Social Diseases of the Minnesota State Medical Association in coöperation with the United States Public Health Service, the Minnesota State Board of Health and various local and municipal boards of health.

"It is also suggested that adequate surveys be made of the existing facilities and that supplementary aid from the Federal Government or the State of Minnesota and other governmental divisions be contributed to existing agencies rather than for the purpose of establishing new clinics and health centers for the diagnosis and treatment of venereal diseases.

"It is further suggested that local county medical societies shall be responsible, in the development of new clinics and health centers, for the diagnosis and treatment of venereal diseases when inadequate facilities exist.

President's Letter

THE State Meeting gave us all an opportunity to refresh our knowledge on scientific subjects as well as to observe the newer methods employed in laboratory procedure. It should serve as a stimulus to encourage us to read more thoroughly our medical journals and to attend as many medical meetings as possible. None of us remains stationary. We either grow with scientific medicine or retrogress and fall by the wayside. It is hoped that all of you will take an active part this coming year in your county organizations and not leave the responsibility of committee activities to the other fellow.

The development of welfare boards will require thoughtful consideration. Thus, it is believed that local problems of health are solved better if the physicians of a community work through their county organizations rather than as individuals. It is our duty to advise commissioners concerning the care of the sick. We know their needs and desires. Therefore, let us see that they shall continue to have the privilege of free choice of physician.

A. W. ADSON, M.D.

ties exist. The members of the county medical society in a given county may designate licensed practitioners of medicine to conduct examinations and administer treatment in the control of venereal diseases of those persons financially unable to provide the same. From available funds, such physicians conducting such examinations and administering such treatment shall be paid a reasonable fee for their professional services."

New Constitution

The new constitution and by-laws substantially as printed in earlier issues of MINNESOTA MEDICINE, had their final hearing and are now the official guide and law of the state association. Copies in their final form will be available shortly through the state association offices.

Funds For Public Health Education

An extra \$1,000 was added by the Council to the budget of the Committee on Public Health Education in order to permit the committee to assume a proper leadership in the manifold health education campaigns now being carried on by lay or by state and federal public health agencies. This money was formerly in the budget of the public health education committee but was removed last year to permit of expansions in other directions in association work. The vital importance of state association participation in these new movements prompted the Council to restore the budget this year.

Minnesota's Cancer Program

An executive committee which will be in control of all expenditures of funds raised in Minnesota for the cancer education program of the Women's Field Army of the American Society for the Control of Cancer was appointed, with the approval of the Council, by the Committee on Cancer of which Dr. Martin Nordland is chairman. This latter committee last winter assumed the position of executive advisory committee of the Women's Field Army.

The new committee was appointed at a meeting of the Council with Dr. Nordland, Mrs. Harlow Hanson, Minneapolis, Commander of the Women's Army, Dr. F. L. Rector, Field Secretary of the American Society for the Control of Cancer, and Dr. William A. O'Brien, University of Minnesota, state chairman of the cancer society.

The following persons were appointed: Dr. Nordland, chairman; Mrs. Hanson, co-chairman; Dr. J. M. Hayes, Minneapolis, president-elect of the state medical association; Dr. E. A. Meyerding, St. Paul, secretary of the medical association; Dr. O'Brien, Mr. Louis W. Hill, Jr., treasurer for the Women's Field Army, and Dr. L. R. Critchfield, St. Paul, chairman of the Committee on Public Health Education.

The medical society officials will serve jointly with the cancer society and Women's Field Army officials to control every detail of the campaign and to guide it along useful paths in Minnesota.

Privileged Relations

Attention of all physicians was specifically directed by the Council to be brought once more to the special character of the physician-patient

relationship. This relationship is privileged and doctors of medicine, in their dealings with insurance companies in particular, **SHOULD NOT FORGET THEIR CODE OF ETHICS.**

Summer Round-up

A definite endorsement of the objectives of the Summer Round-up of the Parent-Teacher Association was presented and approved by the House of Delegates.

The text of the endorsement, which follows closely the endorsement passed by the House of Delegates of the American Medical Association, is printed below. Members are urged to familiarize themselves with it as an aid in making local arrangements for Summer Round-up campaigns in their communities.

"WHEREAS, The American Medical Association cooperates with the National Congress in this program in these ways:

"1. By order of the Board of Trustees the director of the Bureau of Health and Public Instruction, acts as a member of medical advisory board which approves of the physical examination blanks, instructions for leaders and leaflets for parents.

"2. By donating the medical record forms for the program.

"THEREFORE BE IT RESOLVED, That the Minnesota State Medical Association follow the lead of the American Medical Association in approving the purpose of the Summer Round-Up and offering its cordial coöperation to the Minnesota Parent-Teacher Association in promoting the program and in working out proper methods of procedure."

Sex Crime

The problem presented to the doctor by the general public sentiment for reporting potential sex criminals will be studied by the Medico-Legal Committee as a result of the following resolution passed by the House:

"RESOLVED, That a Committee should be appointed by the House of Delegates of the Minnesota State Medical Association to study the whole matter of reporting potential sex criminals and looking to the possibility of recommending a change in the Minnesota statute and unwritten law on privileged communications to permit physicians to coöperate more fully with the police in the suppression of sex crimes."

Herman M. Johnson Fund

A resolution making definite and permanent for all time the objective and management of the Herman M. Johnson Memorial Fund was in-

roduced into the Council and passed by the House of Delegates. The fund has now approached within \$200 of its goal of \$2,000. The first lectureship, tentatively scheduled at the time of the annual meeting, was postponed because of inability of the speaker, the Honorable Theodore Christianson, first lecturer, to be present.

This is the resolution:

"WHEREAS, Almighty God did remove from our midst on the 18th day of June, 1935, one of the outstanding members of the medical profession of the state of Minnesota, Dr. Herman M. Johnson of Dawson, whose work and achievements are known to all of us in the present generation, and

"WHEREAS, It is the wish of many members of the medical profession of this state to perpetuate Doctor Johnson's memory so that those who will practice medicine in years to come in the state of Minnesota will be able to understand, appreciate and continue the work that has been done to raise the standards of medicine and to reduce quackery to a minimum, thereby adding to the health and welfare of the people of this state, and

"WHEREAS, Contributions have been made by friends of Doctor Johnson throughout the state of Minnesota, to effectuate this purpose; now

"THEREFORE, BE IT RESOLVED by the Minnesota State Medical Association, through the House of Delegates, that the money so contributed in the past, and to be contributed in the future, be and the same hereby is set apart irrevocably, for all time, in a trust fund, the principal thereof to forever remain intact and interest therefrom to be reinvested in the fund or to be used to establish and maintain a suitable memorial as the Council of the Minnesota State Medical Association shall direct. The aforesaid moneys to be invested and the interest therefrom to be expended by order of the Council of the Minnesota State Medical Association."

Professional Conference

If the Committee that arranged the Congress of Allied Professions had any advance misgivings about the attractions offered by their conferences, the large numbers who attended the Lowry and Auditorium sessions Monday, May 2, must have banished their doubts.

Professional men and women of Minnesota are eager to consult with physicians about their joint professional problems and apparently they are disposed to subscribe to the cardinal policies and principles of Organized Medicine.

It remains only for the physicians, as the logical leaders, to keep in close and friendly contact with them, pay careful attention to the

special problems of each, in order to weld the whole into an influential working body of opinion that may be relied upon to safeguard the essentials of independent professional practice in America.

There was small disagreement in essentials between representatives who spoke at either session.

Agreed On Essentials

All agreed that quality was more important in the long run than quantity in the delivery of professional services; that reservation of freedom of choice to the patient is an important safeguard of quality as well as an important aid to successful treatment.

The panel which followed the first afternoon session developed a slight difference of opinion between certain representatives of the nurses and the hospital executives on the score of the shortage of nurses for elementary bedside care.

It is clear that the problem of standards for nursing education and the inevitable sequelæ of advancement of those standards beyond the point at which the average person is able to pay the fee for nursing care, requires the sensible and sympathetic consideration of everybody involved,—nurses, physicians, hospital executives. In this consideration, they must keep a double objective in mind: first, the maintenance of high standards and a decent wage for the nursing service; second, the provision of a nursing service that will be adequate and available for the needs of everybody, including persons of limited means.

It was agreed on all hands that the physician is the only one out of all who are concerned in care of the sick who may determine the kind and amount of treatment needed by the patient; that the social welfare worker is the one who is best equipped to get information about those who may be entitled to free medical care.

Sickness Insurance Not Recommended

It is clear that group hospital insurance interests all who are concerned in the care of the sick and particularly those who, formerly, were inclined to fasten their hopes upon a general sickness insurance after the European pattern. It is encouraging to note that the inadequacies

and abuses in the European systems have become so flagrant and well known that thoughtful social economists of whatever background are now loath and hesitant about recommending it in Simon-pure form, at least, for America.

Below are some interesting paragraphs selected at random from the talks made by Congress speakers. They indicate quite clearly the current trends of thought among our professional colleagues.

R. Rufus Rorem, Ph.D., Chicago, Director Committee on Hospital Service, American Hospital Association, and Chairman Committee on Accounting and Statistics, National Conference of Social Work:

"Americans need to be educated to the value of good health services. Nearly a half billion dollars is wasted annually on medicines of doubtful value and the services of non-medical healers.

* * *

"No one can possibly be more interested in the quality of health services than the layman who receives them. The medical practitioner has a scientific and professional desire to render good health service. The patient exhibits a personal and emotional demand for the best possible quality. Good health service costs money and the patient or the community should not expect to receive it for nothing. Much poor quality has been the result of the public's ignorance of what constitutes good health service and the consequent unwillingness to meet the costs of such services.

* * *

"No method of paying for medical care should lower the quality of health service received by the people who receive it. Matters of cost or convenience are less important than quality of care. If the American people wish to preserve their community and health they should be prepared to support the practitioners and institutions to a degree and in a manner which will encourage and facilitate high standards of service. What does it profit a man if he save his money and risk his health?

* * *

"Health service is a very technical field of activity. Most phases are, and should be, beyond the capacity of the layman to understand or undertake. But the layman is a specialist in two aspects—in fact he has a monopoly on them. First, he specializes in receiving the health services which are provided. Second, he specializes in the payment of medical bills. The first factor makes the layman intensely interested in quality even though he is very often not a good judge. The second factor makes him interested in the matter of total cost and in the method of payment.

* * *

"Hospital bills are peculiarly adaptable to the insurance method of payment. They are relatively large

and infrequent; they are attended by physicians' fees and involve absence from gainful employment. The growth of voluntary hospital care insurance in America is a sharp contrast to the development of health service in Europe. Except in England, most hospital care is provided by taxation in the various European countries. The health insurance systems of continental Europe pay the hospitals only a fraction of the costs of care received by the insured workers, the balance being met by the local governments, which own and operate most of the hospitals. The English health insurance plan excludes hospital care entirely. The voluntary hospitals rely mainly upon philanthropy, a classification which they attempt to ascribe to the numerous contributory schemes by which the lowest paid workmen are allowed to contribute to the support of the institution in exchange for free care.

"The general hospital as an independent community influence is distinctly an Anglo-Saxon phenomenon. In England the philanthropists support the hospitals through gifts. In America the general public supports them through private fees. The development of hospital insurance under the guidance of the institutions themselves will prolong their private character and delay their being taken over by the impersonal public, namely the governments."

* * *

Miss Helen Beckley, Chicago, Director of Social Service, Cook County Hospital:

Direct relief in our community is based upon the philosophy of minimum standards consistent with reasonable living but provides little or no positive health program within the actual relief set-up. Lack of funds at intervals of legislative action frequently makes even this minimum drop below safety . . .

* * *

"If health services are to be made adequate and available, then some means must be devised by which practice can catch up with our knowledge. The present lag appears to be largely due to lack of funds to pay for service.

"Federal grants for health programs, the extension of public health services into the field of treatment, and the integration of health with welfare and educational divisions are all trends in the changing public policies. To safeguard the practices and policies which through generations have proved sound and adapt them to this changing philosophy is a difficult program for the present generation.

* * *

"Surely as public education demands increasing health measures, standards of personnel and practice must be so protected as to make available the highest qualified talent. This means, in my judgment, consistent and never ending educational propaganda and vigilance in maintaining and sustaining civil service standards and in keeping public opinion so informed that there will be demanded the best professional personnel and practice which the many allied professions have slowly developed for themselves."

Miss Daisy Dean Urch, R.N., Winona, President, Minnesota State League of Nursing Education:

"As many of you know, an eight year study by the Grading Committee of the Rockefeller Foundation made it clear that there is a dearth of nurses prepared for certain fields of nursing in the midst of many unemployed nurses. This condition has persisted throughout the depression.

"... To meet the needs, we are developing long-range, broad-gauge programs in coöperation with other health-minded organizations such as the American Medical Association. One of these programs is that to the Committee on Community Health Service, which advocates community organizations that will assume the responsibility of meeting their own health needs and make plans to provide it. As a result, central bureaux, adequately financed, which employ nurses on a salary and which provide service to all patients in the amounts and at the times and places required are in operation in many places now. These bureaux are not charity supported or state services. They are financed by the people directly... Of course no professional group or groups can go faster in supplying any community need than the people in that community want them to go. The public carries the responsibility for its own health program. But they also have the right to know what can be done. We are obligated to take the leadership in showing the way...

"With our present facilities we cannot provide enough of the type of nurses needed in already planned programs. Our two weaknesses lie in (1) our system of selecting and educating nurses and (2) in conditions of employment of the greatest proportion of graduate nurses. These two problems are inseparable.

"One of our pressing problems is how to provide more nursing schools that are under a 'controlling body whose primary function' is conceived to be education of the students in the school. More endowed and state supported schools are urgently indicated."

* * *

Dean Charles H. Rogers, College of Pharmacy University of Minnesota:

"The practitioners of each individual health profession have been too much concerned with the problems confronting their own profession to think about the troubles of their sister professions. They forget momentarily that the ideal health service to the patient involves a perfect coördination of all health groups in whose functioning no particular member is paramount to or independent of the others. Had there been some coördinating agency such as a council or planning committee of the allied health sciences, composed of men who could see the forest without their view being obstructed by the trees, the adaptation of our services to conditions would have been greatly facilitated and the individual rights and privileges of practitioners in all fields would have been protected."

Dr. W. A. O'Brien, Associate Professor of Pathology and Preventive Medicine, University of Minnesota:

"If the past has taught us anything, it is that any long range planning for the future must provide adequately for preventive medicine. The real results of our joint efforts to improve the health and well-being of the American people are going to come in the future through the prevention instead of the cure of disease."

* * *

Dr. Martha Eliot, Washington, D. C., assistant chief of the Children's Bureau, U. S. Department of Labor:

"Mothers and children of America still have but a fraction of the medical care they ought to have.

"While the drop in infant mortality during the first year of life has been striking during the past decade, the drop does not mean so much if the figures are scanned closely. In 1935 there were 73,000 children under one month old who died, 57,000 under a week old and 78,000 stillbirths.

"Maternal mortality was 62 for each 10,000 mothers in 1915. In 1935 the rate was 58 for each 10,000. Sooner or later the government must increase its funds for maternal and child welfare under the Social Security Act."

* * *

Dr. Maxwell J. Lick, Erie, Pa., President of the Pennsylvania Medical Society:

"We believe that whatever is just and right for the individual is just and right for the group. It is our habit and custom to render services to the individual at reduced fees when circumstances indicate it to be fair and right. If this principle is equitable then it should be applied under similar needs and conditions to the group. To this end, and with the approval of our parent organizations, certain plans for voluntary hospital insurance are being tried. This seems to me to be just and proper, for out of it may evolve a workable, suitable plan, free from political or other extraneous influences, which will meet the major expense of hospital-confining sickness for those least able to afford it...

"We certainly affirm our desire to institute any changes made necessary in view of different economic conditions. We want those innovations; however, to come gradually, to be built solidly by trial and error. Science grows thus. An observation, a fact, a theorem, finally a proof. So with us. Let changes come by accretion. Let there be no radical stampede resulting in disappointment, retrogression and frustrated hopes. This is my answer to those of our profession who clamor for a definite militant program of our own. It would take divine wisdom to foresee the future, but it requires only common sense to keep constantly before ourselves, before the public and before our legislators, the necessity for maintaining unsullied all that is noble and worthy in the art of medicine."

"The Day of Exclusion is Past"

Dr. Nathan B. Van Etten

The economic and social problems of medicine were discussed also at a general assembly for physicians, Tuesday, with Doctor Lick and Dr. Nathan B. Van Etten of New York City, distinguished speaker of the American Medical Association's House of Delegates and nationally accepted spokesman for Organized Medicine, as guest speakers. Dr. Morris Fishbein scheduled for this symposium was prevented by illness from attending the meetings and his place was taken by President A. W. Adson of Rochester.

Dr. Van Etten signed the Minority Report of the Committee on Costs of Medical Care in 1932, explained the position of his minority and of Organized Medicine in general, later, in a number of popular publications. His concluding remarks at this session for doctors are given here because they provide some excellent practical advice for physicians from an authoritative leader of medicine in the United States.

Dr. Van Etten:

"The day of exclusion and seclusion is past. Generous coöperation with all physicians and with social agencies must be developed. Hospital zones must be planned and all competent physicians living within the zones must be permitted the use of the hospitals' facilities. Individualism has been sneered at by welfare groups which are struggling for warm places in snug bureaus, but after all is said, and after studying all of the European service plans which employ more lay managers than physicians, which pay clerks more than doctors, we must pay tribute to the best traditions which we have in this country which are based upon the individual care of the sick by the individual physician.

"An American physician represents one of the most highly educated groups of the community but he rarely functions as a citizen. Less than thirty per cent of the physicians of this great democracy take the trouble to register as voters. How can the medical profession expect consideration from those who make our laws while the physician stands aloof from the actual exercise of citizenship? It seems more important than at any time in our history that physicians should take positions of leadership in all public activities, thereby indicating their willingness to coöperate to the limit of their abilities in the promotion of projects which seem to have community value. In order to be effective, physicians must have more than superficial knowledge of the machinery of government, they must educate themselves to function as citizens in the best sense of whatever citizenship means or implies. Someone has said recently that many people pass uncon-

ciously from adolescence to obsolescence. Unless American physicians can be aroused from their civic adolescence, a similar judgment will be their inheritance. Old men will not easily change from inertia to activity, but young physicians who are realizing the realities of life as never before will adjust themselves to new social conditions, and their experience will stimulate all of us to study the entirely new problems which confront the medical citizen."

The Golden Rule

(Monthly Editorial Prepared by the Medico-Legal Advisory Committee)

That the outcome of many compensation and insurance cases in court is wholly dependent on medical proof, and that medicine is a science wherein divided expert opinion is not uncommon, are truths which cannot be disputed.

In order to carry out the usual procedure of a case involving medical treatment, therefore, medical witnesses must be called both for the plaintiff and the defendant. These medical witnesses should never forget that their testimony is given to instruct and inform, not to confuse the court and jury with regard to the vital medical points in issue.

When two men of equal prominence in the community are arrayed on either side, their opinions at variance, how is it possible for lay jurors—unless the medical testimony is disregarded—to bring in a verdict in accordance with the facts in the case?

Ask any member of the Bar Association what he thinks of the medical man on the witness stand and he will tell you that the average jury decides the case with almost complete disregard of the medical opinion expressed because they do not rely on the experts on either side.

Does not an untruthful, exaggerating physician on the stand break down the confidence of courts in medical testimony? Does he not thus commit a serious crime against society? Likewise if he minimizes unnecessarily, is he less at fault?

Expert against expert, testimony sold to the highest bidder, contingent fees depending on the size of verdicts obtained, make of medical testimony a sham and mockery.

Do these happenings build up confidence in medical practice or are we playing into the hands of quacks and charlatans?

And when the malpractice case is brought before the same judges and juries, have we a

right to ask justice of those whom we have misled by our type of testimony? Your Medical Advisory Committee believes the Golden Rule works both ways.

Are We To Serve As "Guinea Pigs?"

No less than eight new bills have been introduced into the Wisconsin Legislature this year all of which propose some change in the practice of medicine in Wisconsin and only one of which meets the approval of the State Medical Society.

A special meeting of the House of Delegates of the Society was recently called to analyze the bills and formulate principles upon which to base the active policy of the society with regard to them.

They range from a bill to establish an interim commission for study of costs of medical care to bills for encouraging establishment of coöperatives and "third party associations," organized for the purpose of providing medical care, also group hospitalization insurance plans; statewide medical-dental-hospital service to the indigent; permission to counties to erect their own hospitals, to employ medical staffs to treat all county residents, to employ tax-supported physicians to care for all residents of the community; and finally, *compulsory sickness insurance for all employed persons earning \$60 a week or less*. In addition there is a bill to create a consumers' bureau for protection of the public against harmful, misleading or fraudulent advertising of foods, drugs, cosmetics and therapeutic devices. This last bill has the support of the medical society provided a few clarifying amendments are included.

Minnesota Next

Minnesota's interest in these bills, called in Wisconsin the Beimiller bills because they were introduced by Assemblyman Andrew J. Beimiller, may be more than neighborly and theoretical if a news story which appeared May 6 in the *Milwaukee Journal* has any foundation in fact.

Here are the concluding paragraphs of the story, which was devoted, otherwise, to a detailed outline of the Beimiller bills:

"This same group of bills, so it is reported, is to be introduced in the *Minnesota legislature when it convenes in special session late this month*. (The italics are ours.)

"In other words, if possible, Wisconsin and Minnesota are to be made the 'guinea pigs' of rich foundations which have money to spend for the promotion of socialized medicine."

Minnesota has been singularly free from legislative attempts of this sort. That does not mean, of course, that we, like Wisconsin, may not be obliged to come to grips with such a situation at any time. There is no reason to believe, however, that any such extravagant adventures in radicalism will get a serious hearing. It is to be hoped that a close coöperation with official agencies in the programs for public health now launched in the state, a helpful and conscientious profession coupled with an alert committee on public policy will serve to prevent any headlong and ill-considered experimentation with medical care in Minnesota.

Not Licensed in Minnesota

The letter quoted below came to state headquarters from Mr. Frank Yetka, Commissioner of Insurance of the State of Minnesota, with the request that it be brought to the attention of every member of the Minnesota State Medical Association:

"The Postal Indemnity Company of Dallas, Texas," says the letter, "is circularizing many of the physicians and surgeons of this state and soliciting them for health and accident policies.

"This company is not licensed by the Insurance Division of the Department of Commerce of Minnesota to engage in the business of insurance in the State of Minnesota. We therefore have no definite information in our files. The only information we have concerning them is contained in a private publication which states that as of December 31st, 1935, the company showed total admitted assets of \$29,661. Total cash income for that year was \$87,716. They paid claims totalling \$28,473.00 and paid out in expenses, salaries, etc., \$49,261.00. In the event of any dispute or difficulty with them between the insured and the company, this Department could be of no assistance in the matter. Should the insured desire to sue the company, he would not be able to get service in the State of Minnesota on the company. It would more than likely be necessary for him to go to the State of Texas to commence action. The company pays no taxes to the State of Minnesota.

"In view of the foregoing, this Department most

heartily recommends that citizens of the State of Minnesota do not purchase insurance in companies not licensed by this Department. May we solicit the aid of your good office in an attempt to get this information to the physicians and surgeons in the State?"

Minnesota State Board of Medical Examiners

Minneapolis Woman Pleads Guilty to Abortion

Re: State of Minnesota vs. Jeanne Martin, Alias Esther G. (Marcoc) Talbot.

Jeanne Martin, alias G. (Marcoc) Talbot, thirty-two years of age, entered a plea of guilty on March 5, 1937, in the District Court of Hennepin County, to an indictment charging her with the crime of abortion. The defendant was indicted by the grand jury of Hennepin County, on February 26, 1937, charged with performing an abortion on a young married woman. On April 1, 1937, following an investigation by the Probation Officer of Hennepin County, the defendant was sentenced to a term of not to exceed four years in the Women's Reformatory at Shakopee, Minnesota, and was placed on probation for four years in charge of the Probation Officer.

The evidence obtained by the Minneapolis Police Department, and particularly the Women's Bureau, indicated that the defendant had been engaged in this unlawful work for a period of approximately two years, and that she had performed in excess of seventy-five criminal abortions. The defendant was paid \$30.00 for performing this criminal abortion. The evidence also indicated that the defendant had collected approximately \$1,500.00 for this unlawful work. She resided at 212 E. 15 Street, Minneapolis, where the abortions were performed. The defendant stated that she had never studied medicine, nursing, nor had she received any training whatever in the field of healing. The defendant advanced as a reason why she should be placed on probation, the present state of her health. She claims to have been operated upon for the removal of her appendix, gall bladder, pelvic tumor, abdominal hernia and bowel obstruction. Prior to being sentenced she was examined by Dr. James E. O'Donnell, 1020 Donaldson Bldg., Minneapolis, and Dr. Thomas Warham, physician for Hennepin County. Both of these physicians advised against incarcerating the defendant because of the defendant's physical condition. The evidence showed, however, that prior to the time of her arrest, the defendant had taken little, if any, steps to improve her health.

The defendant stated that her true name is Esther G. Talbot and that her maiden name was Esther G. Marcoc. She stated that she was born at Bellevue, Nebraska, and that she was raised in Omaha, Nebraska, and Sioux City, Iowa. She was married in 1931, to James Edward Talbot. For some reason or other they have been living in Minneapolis under the name of Martin.

The State Board of Medical Examiners believes that the increasing number of criminal abortions performed in Minneapolis, would indicate that more strenuous measures will have to be taken to eradicate a situation that jeopardizes the life of every person upon whom one is performed. The Medical Board commends highly the splendid work done by the Women's Bureau of the Minneapolis Police Department.

Two "Indian Doctors" Arrested in Houston County

Re: State of Minnesota vs. John Stanley, also known as William Stanley.

Re: State of Minnesota vs. Billy Stanley, also known as Billie Stanley.

On May 15, 1937, Sheriff Arthur Brown, and his deputies George Kelly and Arthur Murray, arrested two "Indian Doctors" in Crooked Creek Township, Houston County, Minnesota. The defendants had gone to the farm home of one Gerhard Welsh, representing that they could cure him of his so-called rheumatic condition with the roots and herbs that they had with them. While they were at the Welsh farm neighbors notified the Sheriff's office and they were immediately arrested. On May 16, 1937, they pleaded guilty before Jerry Kenny, Justice of the Peace, to selling herbs and drugs, the same having no medicinal or curative value. The defendant, Billy Stanley, who claims that she is the wife of John Stanley's father, was fined the sum of \$40.00 and costs of \$20.00, which was paid. John Stanley was put on probation to the Sheriff and both defendants, together with the husband of Billy Stanley, were given twenty-four hours by the Court to leave the State of Minnesota permanently. The two defendants represented themselves as being twenty-two years of age and claimed to be of Osage and Cherokee ancestry. They claimed to have been in the State of Minnesota less than thirty days and to have been living near Canton, Minnesota. They were driving a 1937 Buick Sedan with Minnesota License Number B 571-914. They stated that the automobile was purchased at San Antonio, Texas.

Sheriff Brown and his deputies, Mr. Kelly and Mr. Murray, are to be commended for their prompt action in the apprehension of these defendants. Mr. L. L. Roerkohl, County Attorney of Houston County, also cooperated in every manner in the handling of this case.

◆ OF GENERAL INTEREST ◆

A new office and laboratory are being constructed for Dr. Charles Vandersluis of Bemidji.

* * *

Dr. and Mrs. Roy E. Swanson have been vacationing in the east and in Bermuda.

* * *

Dr. Paul B. Monroe was elected president of the Two Harbors Rotary Club at their annual meeting.

* * *

Dr. F. R. Huxley of Faribault recently spent a month in Mexico.

* * *

Dr. W. D. Beadie of Cannon Falls conducted a chest clinic in South Saint Paul on May 19.

* * *

Dr. Frank D. Smith of Kasson has opened an office for the practice of medicine in Rochester.

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The home of Dr. W. C. Carroll at Lake Josephine was damaged by fire on May 13, which caused damage amounting to about \$1,500.

* * *

Dr. Charles F. Stroebel, a graduate of Rush Medical College, has opened an office in Northfield for the practice of general medicine.

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Mrs. Winona O. Mann, widow of Dr. Arthur T. Mann, died on April 21. She had been a resident of Minneapolis for more than fifty years.

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Dr. F. E. Harrington, city health commissioner, has been appointed acting superintendent of General Hospital, Minneapolis.

* * *

Dr. J. Arnold Borgen of Rochester was elected president of the Central Clinical Research Club at a meeting held last month.

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Dr. Thomas Armstrong, formerly of the Mayo Clinic, Rochester, has moved to Michigan City, Indiana, where he is associated with the Warren Clinic.

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Dr. C. F. McComb is one of the oldest established members of the medical profession in Duluth, having been in continuous practice there since 1883.

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Dr. H. B. Harlow has come from Cleveland, Ohio, to join the Lenont-Peterson Clinic at Virginia, specializing in the eye, ear, nose and throat field.

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Dr. A. G. Berger has been appointed to succeed Dr. R. T. Westman as chief city quarantine officer of Minneapolis.

Dr. and Mrs. M. L. Mayland of Faribault have just returned from Florida, where they spent a two months' vacation.

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Dr. E. V. Pelletiere recently joined the Bratrud Clinic in Thief River Falls, taking charge of the eye, ear, nose and throat department.

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Dr. Homer Hedemark has recently become affiliated with the Bratrud Clinic in Thief River Falls, specializing in internal medicine and surgery.

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Dr. F. E. Harrington of Minneapolis will attend the National Tuberculosis Association convention in Milwaukee, May 31, June 1 and 2.

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Dr. Paul W. Giessler announces his association with Dr. John F. Pohl, recently of Boston, at 1945 Medical Arts Building, Minneapolis. Their practice will include fractures and orthopedics.

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Dr. John J. Gelz, of St. Cloud, who is in Tucson, Arizona, because of ill health was reported to have had a serious attack of illness in April, but is now improving.

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Dr. A. F. Sether is opening an office in the Oberle building at Ruthton, for the practice of medicine. Dr. Sether was formerly stationed at a CCC camp at Grand Rapids.

* * *

Dr. Paul F. W. Rick, formerly of Saint Paul, has opened an office for the practice of medicine in Le Center, Minnesota. He has just completed his internship at the General Hospital, Minneapolis.

* * *

Dr. Wilfred J. Bushard, of Minneapolis, who has just completed his internship at the General Hospital, Minneapolis, has opened an office at Bird Island, for the practice of medicine.

* * *

Dr. T. S. Soine of Barnesville has gone to Newberg, Oregon, where he expects to practice. He has been succeeded by Dr. Carl Simison, who has been associated with his father, Dr. C. W. Simison, at Hawley.

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Dr. R. N. Barr of the Minnesota Rural Health Service, Minneapolis, was the guest speaker at the P.T.A. meeting in Fergus Falls on May 10. He spoke on public health matters in ancient and modern times.

* * *

Mrs. Adelgunda Meyerding, mother of Dr. E. A. Meyerding of Saint Paul, and Dr. Henry W. Meyer-

HOSPITAL NOTES

ding of Rochester, died at Colonial Hospital in Rochester, early in May. She was a pioneer resident of Saint Paul, having come to that city in 1859.

* * *

Dr. Arthur C. Strachauer, professor of surgery in the Medical School of the University of Minnesota, gave the public lecture on cancer in conjunction with the annual meeting of the Iowa State Medical Association at Sioux City, Iowa, May 12, 1937.

* * *

Dr. L. R. Boies of Minneapolis, with a net score of 66, was the winner of the annual golf tournament of the Minnesota State Medical Association at the Midland Hills club. Dr. Gus Edlund of Saint Paul, with a score of 80, won low gross honors.

* * *

Dr. Henry E. Michelson was the principal speaker at the meeting of the Camp Release District Medical Society at Montevideo on Thursday evening, May 20, his subject being "Syphilis and Its Treatment." Dr. Michelson addressed the Wayne County Medical Society, Detroit, Michigan, on the same subject, May 24.

* * *

Dr. Gaylord W. Anderson, deputy commissioner of public health in Massachusetts, has been appointed Head of the Department of Preventive Medicine and Public Health of the University of Minnesota, to succeed Dr. Kenneth Maxcy, who recently resigned to take a similar position at Johns Hopkins University, Baltimore.

* * *

Dr. Ragnar Westman, epidemiologist, Minneapolis Division of Public Health, has been appointed Director of the County Health Unit in Bay County, Michigan, with headquarters in Bay City. This is a newly formed unit, no work of this kind having been done previously in that county. Dr. Westman is a graduate of Johns Hopkins Medical School, 1936.

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A large number of physicians and surgeons living in many parts of the United States returned to Minneapolis on May 11 for the annual meeting of St. Mary's Hospital Internes' Association. Dr. A. E. Ritt of Saint Paul is president, and Dr. M. W. McInerney and Dr. R. F. Herbst, both of Minneapolis, are vice president and secretary.

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Dr. Hewitt B. Hannah and Dr. Joel C. Hultkrans announce their association in partnership in the practice of neuropsychiatry with offices at 511 Medical Arts Building, Minneapolis. Dr. Hultkrans has been practicing neuropsychiatry in Saint Paul, but will give up his office there upon opening an office for the continuation of the practice of the specialty in Minneapolis.

HOSPITAL NOTES

May 16 was the twenty-eighth anniversary of the dedication of the St. Lucas Hospital at Faribault. The hospital was constructed in 1909 at a cost of \$65,000.

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Miss Mary R. Fye, former superintendent of Franklin Square Hospital at Baltimore, Maryland, is the new director of the Municipal and Detention Hospitals, at Virginia, Minnesota.

* * *

Joseph G. Norby, superintendent of Fairview Hospital for fifteen years, has resigned to accept a similar position at Columbia Hospital, Milwaukee. He has been succeeded by E. J. Hauge, of Fort Dodge, Iowa.

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Dr. W. H. Halloran, of Jackson, is adding eight new rooms to his hospital, which will include a fully equipped operating room, x-ray equipment and modern new sterilization room. This hospital has been in operation for the past twelve years.

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The new psychopathic ward at the University Hospital was opened Tuesday, April 27. This was erected at a cost of about \$150,000, and has a bed capacity for forty-two patients. The equipment is of the newest type, including safety devices of various kinds. Two comfortable lounge rooms and a wire-enclosed balcony walk are also provided, as well as complete kitchen facilities.

* * *

The municipal hospital at Virginia is to be extensively improved this spring, with the assistance of WPA funds. The Hospital Association is to supply the materials. Included in the improvements are a garage and a tunnel to connect the nurses' new home with the hospital. The hospital itself has just recently been completed.

* * *

Northwestern Hospital, Minneapolis, now in its 55th year of active service, is planning an elaborate program for a reunion and homecoming of its former interns. This will take place on Saturday, June 19, and will occupy the entire day. From 8:00 A. M. to 1:00 P. M. clinical and other scientific demonstrations will be conducted by the staff at the hospital, followed immediately by luncheon in the institution. Then the entire gathering will take a boat ride on the Mississippi, leaving at 3:00 P. M. and returning about 10:00 P. M. During the boat trip there will be a program of varied entertainment, with light refreshments and dinner on the boat at 6:00 P. M. The boat is the "Donna May," a large and seaworthy craft commanded by Captain W. G. Holstrom.

The committee in charge of all arrangements, Dr. A. E. Benjamin and Dr. W. A. Hanson, is eager to get in touch with all former interns of Northwestern Hospital and asks that any who know the names and present addresses of any of them will please inform the committee.

In Memoriam

Julian A. Du Bois

1856—1937

DR. JULIAN A. DU BOIS, a prominent resident of Sauk Center, where he had practiced for over fifty years, passed away at his home at the age of eighty-two, May 4, 1937, after a month's illness.

Dr. Du Bois was born in Aztalan, Wisconsin, January 8, 1856. He attended the University of Wisconsin from 1873 to 1877. He was a classmate of the late Senator Robert M. La Follette and remained a close friend of the senator throughout his life. In 1879 Dr. Du Bois graduated from Rush Medical College with high honors and began practice at Lake Mills, Wisconsin. Later he went to Denver, where he took an internship of thirteen months at the Rapoho Hospital.

He then went to Saint Paul, intending to practice there, but an epidemic of smallpox breaking out at Spring Hill, Stearns County, he was sent by the State Board of Health to vaccinate residents of the community. His successful handling of the situation received high commendation from state officials.

In 1882, Dr. Du Bois located in Sauk Center, where he had practiced since. For many years he was surgeon there for the Great Northern and Northern Pacific railroads, besides conducting an extensive and in the early days a strenuous practice.

Dr. Du Bois was married April 1, 1881, to Laura R. Faville of Lake Mills, Wisconsin, and on April 1, 1931, their golden wedding was celebrated. To them were born three sons, Ben Du Bois, postmaster at Sauk Center; Dr. Julian F. Du Bois of Sauk Center, secretary of the Minnesota State Board of Medical Examiners; and Faville Du Bois, who was killed by lightning in 1906.

Dr. Du Bois was a candidate in 1902 and again in 1914 for Congress from the Sixth District, but although he gave a good account of himself, he was not elected. He was also a candidate for the State Senate at one time. He was twice elected mayor of Sauk Center and for many years served as city treasurer.

Appreciative of good literature, he was active in library work and for many years was a member of the Board of Directors of the Bryant Library. He was president of the Merchants National Bank and later president of the First State Bank and successfully operated several farms in his community.

The following tribute appeared in the *St. Cloud Daily Times*:

"The sad news came from Sauk Center this morning of the death of one of the distinguished citizens of the state, who had obtained more of life than most. He was one of the earliest of the pioneer physicians of Stearns county, and the dean of the medical fraternity. The pioneer doctors faced hard conditions. They had to visit patients in the country for miles, when the

roads were merely trails, but they went sometimes at the peril of their lives in bad storms. That was real heroic service. When called to administer to the ill, he accepted the challenge as a test of his skill and care. To him each serious illness was a battle—and the victories he won gave him an admirable reputation in healing. When death came, as it comes to all men, and today to Dr. Du Bois, his patients knew that he had done his utmost, and they were grateful.

"He was a well educated man, gaining knowledge each day, a keen student of affairs, a lover of good literature, himself a gifted poet and writer.

"But his great affection was for human beings. It was often said that he loved folks, and was ever ready to serve them, and to him each individual was a child of God, to be aided along the way in usefulness and happiness, with an understanding of their weaknesses and of their virtues.

"He had a most charming personality, wise in the selection of his friends, his choice not on wealth or position, but on character and good fellowship.

He lived a long and useful life, with that independence of spirit and great courage that made him an outstanding man of his community and a gallant leader.

"It can be said of him in most complete assurance: He was the captain of his soul, and never was his head bowed in fear."

Halvor Holte

1857-1937

DR. HALVOR HOLTE, a pioneer physician of Crookston, died January 2, 1937, at the age of seventy-nine.

Dr. Holte was born at Stavanger, Norway, July 11, 1857, and came to America at the age of fifteen. He was the first homesteader at Holt, Minnesota, which was named for him.

Dr. Holte was married in 1902 to Henrietta Lunde at Maplebay. His wife, one son, Junius, and one daughter, Mrs. George Hagen, survive him.

In 1897 Dr. Holte established the Bethesda Hospital and launched the movement which resulted in the establishment of Sunnyst Sanatorium.

George T. Joyce

1879-1937

DR. GEORGE T. JOYCE, in general practice in Rochester, Minnesota, since 1904, died March 29, 1937, from coronary thrombosis.

Born at Stewartville, Minnesota, January 25, 1879, he attended the rural schools in that vicinity and later the high school in Rochester for two years. After a two year preparatory course in Des Moines, he became a student at the medical school of the University of Illinois, where he graduated in 1904.

Dr. Joyce began practice in Rochester in 1904 and for three years was associated with Dr. Charles T. Granger. He served as councilman from 1908 to 1910 and on the utility board for one term. He was a member of St. John's Catholic Church at Rochester, and belonged to the Knights of Columbus.

Dr. Joyce was a member of the Olmsted County Medical Society and a past president. He was also a mem-

REPORTS AND ANNOUNCEMENTS

ber of the Minnesota State Medical, the American Medical and the Southern Minnesota Medical Associations.

In 1906, Dr. Joyce married Josephine Baier. He is survived by his widow, two daughters, Mrs. Thomas Starkey of Beardstown, Illinois, and Helen, a student at the University, and a son, George T., Jr. A nephew, Dr. George L. Joyce, recently left Stewartville to take over his uncle's practice in Rochester.

Elias Potter Lyon

1867-1937

ELIAS P. LYON, former dean of the Medical School of the University of Minnesota, died May 4, 1937, at Trafford, Pennsylvania. Dr. and Mrs. Lyon were on their way back to Minneapolis from Florida, where they had spent the winter. At the time of his retirement last June, Dean Lyon had served longer than any medical school head in the country.

Dean Lyon was born in Cambria, Michigan, in 1867. He attended Hillsdale high school and graduated from Hillsdale College, Michigan, in 1891. He received his Ph.D. degree at the University of Chicago in 1897 and took additional work at Heidelberg University, in Germany.

From 1897 until 1900 he served as instructor at the Bradley Polytechnic institute in Peoria, Illinois, and became assistant professor of physiology in the University of Chicago and later assistant dean in Rush Medical College from 1901 to 1904. He was dean of medicine at St. Louis University from 1904 until 1913. He then came to Minneapolis to begin his service as dean of the medical school at the University of Minnesota.

While at the University of Chicago, Dean Lyon was associated with Dr. Jacques Loeb, known for his scientific attainments in connection with the Marine Biological Laboratories at Woods Hole, Massachusetts. In 1894, he was the Associated Press correspondent and biologist on the expedition to Greenland with Fred A. Cook when he claimed to have discovered the North Pole. At the time of his death he was a lieutenant colonel, retired, in the sanitary corps of the United States Army.

Dean Lyon took a part in the remarkable development and growth of the University of Minnesota Medical School during the years when he was dean. He first installed the system of full time teachers in certain departments of the medical school, and contributed to many journals in the fields of physiology, medical education, nursing education and general science. He was a former officer of Alpha Tau Omega and Sigma Xi fraternities.

On June 10, 1936, a testimonial dinner was held at the University for a number of retiring members of the medical school faculty, among whom was Dean Lyon. At this dinner Dr. Adam M. Smith announced the establishment by the Minnesota Medical Alumni of the Elias Potter Lyon lectureship in honor of the re-

tiring dean. Tribute was paid by President Coffman to the sterling qualities of the dean, and Dr. Diehl outlined the growth and development of the medical school from its beginning in 1888 and presented a portrait of Dean Lyon by Brewer, to the University. Dean Lyon's response and the addresses of those present at the dinner, appeared in the December, 1936, number of MINNESOTA MEDICINE.

Dean Lyon served the Medical School for twenty-three of the forty-nine years of its existence. During that period many additions were made to the physical equipment of the school, many full time faculty members were added and the affiliation of the medical school with the Mayo Foundation was accomplished.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR JUNE

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 9:45 o'clock every Saturday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month will be as follows:

- June 5—Avitaminosis
- June 12—Water Cures
- June 19—Diverticulitis of the Colon
- June 26—Calcium and Dentistry

MINNESOTA RADIOLOGICAL SOCIETY

The annual meeting of the Minnesota Radiological Society was held in Saint Paul, Minnesota, in connection with the meeting of the Minnesota State Medical Society. The annual Carman Lecture was delivered to the general assembly of the Minnesota State Medical Association by Dr. Edward H. Skinner of Kansas City on "Reflections on the Roentgenology of Fractures."

Dr. Skinner also addressed the Minnesota Radiological Society on the subject "Comments upon Early Books upon Electricity and the Roentgen Ray."

Dr. Robert S. Stone of San Francisco delivered the annual Christian Lecture on Cancer before the State Medical Society. His subject was "Irradiation Therapy of Tumors with a Consideration of the Possibilities of Supervoltage X-rays." He also addressed the Minnesota Radiological Society on "The Professional and Economic Status of the Radiologist."

Officers for the coming year were elected as follows: President, Dr. Walter H. Ude, Minneapolis; vice president, Dr. Leo G. Rigler, Minneapolis; secretary-treasurer, Dr. Harry Weber, Rochester.

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MINNESOTA HOSPITAL ASSOCIATION

At the convention of the Minnesota Hospital Association held early this month, the following officers were chosen: Dr. Peter D. Ward of Miller Hospital, Saint Paul, president; A. G. Stasel, Eitel Hospital, Minneapolis, first vice president; Miss Esther Wolfe, R.N., Hutchinson Community Hospital, Hutchinson, second vice president; and Ray Amber, University Hospital, Minneapolis, treasurer.

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HENNEPIN COUNTY SOCIETY

Dr. Henry L. Ulrich was named president of the Hennepin County Medical Society at a meeting held Monday night, May 10. Dr. Norman Johnson was named first vice president, and Dr. F. C. Rodda, second vice president. The following committeemen were chosen: *Executive Committee*, Dr. James K. Anderson and Dr. Gilbert Cottam; *Board of Censors*, Dr. Julius Johnson and Dr. Ivar Sivertsen; *Board of Trustees*, Dr. Erling W. Hansen and Dr. James S. Reynolds; *Ethics*, Dr. Stephen H. Baxter and Dr. Richard R. Cranmer. Delegates named to the State Medical Association were Dr. Henry Bayard, Dr. Douglas P. Head, Dr. C. O. Maland, Dr. Erling S. Platou and Dr. Chester A. Stewart.

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RICE COUNTY SOCIETY

The Rice County Medical Society held a meeting in the Faribault Clinic Rooms, Tuesday, April 27. Dr. G. R. Kamman of Saint Paul presented an interesting lecture on "The Psychiatric Disorders Coming in the Involutional Period of Life." Dr. E. R. Beede spoke on "Sterilization in Feeble Minded Girls." Discussion followed by Dr. A. L. Haynes and J. M. Murdock, Superintendent.

The Nutritional Significance of Gelatin

The Council on Foods has endeavored to evaluate the nutritional claims made for gelatin. In view of the available evidence the Council believes that gelatin properly made is a wholesome food, that it has special usefulness when one desires to add variety to the diet by incorporating gelatin in nutritious soups or pleasant desserts, and that for these reasons it is often a useful food for inclusion in the diet of healthy persons or of sick or convalescent patients. Gelatin appears to be well tolerated. The claim that gelatin is an aid in the digestion of milk, however, is in the opinion of the Council not established. The claim that gelatin is of value as a source of amino-acetic acid in the treatment of some of the myopathies cannot be recognized; in the light of present evidence, gelatin has no special significance as a source of amino-acids in the diet. Indeed, it is notoriously deficient in certain essential amino-acids. (J. A. M. A., Dec. 26, 1936, p. 2132).

JUNE, 1937

WOMAN'S AUXILIARY

Mrs. E. M. HAMMES, President,
1456 Summit Avenue, Saint Paul
Mrs. A. A. PASSER, Editor, Press and Publicity, Olivia

MRS. J. F. Norman of Crookston was installed as president of the Woman's Auxiliary at the annual meeting held in Saint Paul, May 3, 4 and 5. Other officers elected were: Mrs. W. S. Roberts, Minneapolis, president-elect; Mrs. J. J. Ryan, Saint Paul, first vice president; Mrs. John Dordal, Sacred Heart, second vice president; Mrs. R. S. Forbes, Duluth, third vice president; Mrs. R. J. Josewski, Stillwater, treasurer (re-elected); Mrs. Harold Wahlquist, Minneapolis, recording secretary; Mrs. G. E. Hertel, Austin, auditor. Mrs. E. M. Hammes, Saint Paul, retiring state president, presided at all sessions, which were well attended.

Kandiyohi-Swift-Meeker

A regular meeting of the Auxiliary was held in February and a new Constitution drafted. There are sixteen paid-up members in the re-organized group.

At the March meeting the members were guests of Mrs. Hutchinson, at the State Asylum, and adjourned to the Lakeland Hotel in Willmar to see colored slides of a Canadian hunting trip which were shown by Dr. Kenneth Bulkley. Mrs. E. M. Hammes, of Saint Paul, was the guest speaker of the Auxiliary on April 14. Mrs. A. F. Branton of Willmar is president of this group. Other officers are Mrs. C. L. Scofield, Benson, vice president; Mrs. H. Hutchinson, Willmar, secretary; Mrs. H. Johnson, Litchfield, treasurer.

* * *

Scott-Carver

The Scott-Carver Medical Society and Auxiliary met at Mudeura Sanitarium at Shakopee, March 30. Members of the Auxiliary were entertained at the home of Mrs. H. P. Fischer. The regular business meeting included election of officers. Mrs. Wm. Maertz of New Prague was re-elected president. Mrs. Schemphilling of Chaska, vice president, and Mrs. Charles Cervenka, secretary-treasurer. Mrs. Clement of Shakopee joined the Auxiliary.

* * *

West Central

A regular meeting of the West Central Auxiliary was held on April 14 at the Merchants Hotel in Morris. The state president, Mrs. E. M. Hammes, was a guest at the seven o'clock dinner and gave an interesting talk at the business session which followed.

The Auxiliary voted a memorial offering of two dollars in memory of Mrs. Fitzgerald of Morris, who had served the Auxiliary faithfully in many capacities.

Officers elected at this meeting were Mrs. Otto Bergan, Clinton, president; Mrs. F. W. Behmler, Morris, vice president; Mrs. I. L. Oliver, Graceville, secretary-treasurer. Mrs. R. Bate of Glenwood was voted a new member.

TRANSACTIONS of the MINNEAPOLIS SURGICAL SOCIETY

Meeting of October 1, 1936

The regular monthly meeting of the Minneapolis Surgical Society was held in the lounge of the Hennepin County Medical Society rooms on October 1, 1936. The meeting was called to order by the president, Dr. Ivar Sivertsen.

The following scientific program was presented.

OPERATIVE TREATMENT OF HYDRONEPHROSIS DUE TO OBSTRUCTION AT THE URETEROPELVIC JUNCTION

C. D. CREEVY, M.D.

Abstract

The speaker described the causes of hydronephrosis due to obstruction at the ureteropelvic junction as due to fibrosis in or about the ureter, accessory renal vessels associated with nephroptosis, neurogenic dysfunction of the pelvis or ureter, and non-dependent attachment of the ureter to the renal pelvis.

Symptoms may consist of continuous or intermittent pain in the flank, recurrent or chronic pyuria or reflex gastro-intestinal disturbances without pain. Dietl's crisis is rarely seen. The kidney may be palpable during attacks and recurrent pyelonephritis is the most frequent picture.

Diagnosis is made by a pyelogram, which shows a hydronephrosis and normal ureter.

Fifteen of the twenty-five cases seen at the University Hospital since April, 1930, were removed, some because of late medical consultation, some because it is not realized that kidneys containing as little as one-third of their parenchyma can be reclaimed by conservative operation. Non-operative procedures are of limited value.

Kuster (1892) was probably the first to operate conservatively for this condition. He ligated the ureter and, after cutting it off below the ligature, reimplanted it into the dependent portion of the pelvis. This operation, though still widely used, may lead to recurrence. Fenger (1894) incised the stricture longitudinally and closed it transversely, but it has been shown that this may result in a kink in the ureter.

When the ureter is angulated and plastered against the pelvis, von Lichtenberg has made a lateral anastomosis between them based on the Finney pyloroplasty. The method has been used successfully by Walters. It has the objectionable feature that the spur formed between the ureter and pelvis may become edematous and cause obstruction.

Gayet has advocated resection of the redundant pelvis in such a manner as to place the ureter in a dependent position, but this operation fails to correct the obstruction, which Gayet assumed to be due to the high attachment of the ureter.

The author does not believe that anomalous vessels cause obstruction unless the ureter is angulated and fixed around them by peri-ureteral fibrosis or nephrop-

tosis and prefers in such cases to widen the ureteropelvic junction. Simple ligation of the aberrant vessels results in infarction of a portion of the kidney and possible infection necessitating removal of the kidney.

To the author's mind the most satisfactory method of dealing with these cases is the operation devised by Schwyzer and improved by Foley (figure three).

Schwyzzer divided the posterior surface of the upper inch of the ureter by a longitudinal incision which he then prolonged upward onto the pelvis in the form of a V. The apex of the triangular flap of the pelvic wall thus outlined was pulled down to the lower end of the incision in the ureter, and the incision closed as a V, thus widening the junction without interrupting its continuity or angulating it.

Foley has moved the longitudinal incision in the ureter onto its lateral aspect, and extended it above the ureteropelvic junction. One limb of the V incision in the pelvis is placed on its anterior, and the other on its posterior, surface, so that suture places the junction in a dependent position. The V-shaped closure is made by carefully placed interrupted sutures of 0000 chromic catgut on atraumatic needles. These sutures include only the muscularis and adventitia, and do not penetrate the mucosa. A small catheter is placed through the anastomosis and brought out through the posterior surface of the pelvis. Openings into the catheter are so placed that it drains the pelvis, diverts the urine, and splints the anastomosis during healing. More recently Foley has employed an additional catheter as a pyelostomy. Three painful experiences with slipping of such tubes with consequent extravasation of urine into the wound have led me to supplement the diversion of the urine by inserting a No. 22 Malecot catheter into a lower calyx of the kidney as a nephrostomy.

Foley has placed considerable emphasis on the importance of nephropexy, but the author has purposely avoided high fixation of the kidney. He has simply held it high enough to avoid kinking of the ureter by suturing the perirenal fat and peritoneum loosely beneath the lower pole of the kidney, somewhat in the manner of Deming. The results have convinced me that a painstaking nephropexy merely adds unnecessarily to the length of the operation.

The author has performed this operation nine times, supplementing it twice by excision of redundant pelvic wall, and once by resection of the lower pole of the kidney, together with a contained stone which could not be located. In an additional case, Küster's division of the ureter with reimplantation into the dependent portion of the pelvis was done and supplemented by excision of most of the wall of the pelvis.

The first operation was done in November, 1932, the last in June, 1936. The patients ranged in age from ten to fifty-seven years. There were no deaths. Several presented postoperative complications, but all have recovered and are entirely symptom-free at the present

time, with the exception of one patient who required nephrectomy ten weeks after operation because of persisting obstruction and extravasation of urine. All cases operated upon more than six months ago have had pyelograms made at least six months, and in one instance three years, after operation, and have functioning kidneys secreting clear, uninfected urine. In all but one there has been a notable reduction in the size of the pelvis since operation; in the one in which the size of the pelvis has remained unchanged (figure four) an infection of four years' standing has disappeared, together with all symptoms.

Complications of varying severity followed operation in five cases.

In the first of these, a thirteen year old boy, an accessory vessel to the lower pole was divided, a large portion of the pelvis was resected, and the ureter was reimplanted into a dependent position. A fever of 105° F. without subjective or objective findings appeared on the third day and lasted three days, apparently from infarction of the lower pole of the kidney. Thereafter recovery was normal. One and one-half years later the patient was well, the preoperative infection had disappeared, and the kidney functioned well as judged by excretory urography, considering that only one-third of the normal amount of renal parenchyma was present at operation.

In the second, a male of twenty-five, a pseudoleukemia followed operation, the white blood count rising to 47,000 and the hemoglobin falling from 90 to 40 without evidence of hemorrhage. This reaction subsided uneventfully following transfusion. A year later the urine from the right kidney was clear, and retrograde pyelography disclosed a very marked reduction in the size of the renal pelvis.

In the third, colic in the unoperated kidney occurred when the patient got up after operation (resection of the lower pole of the right kidney with an enclosed stone, Y-plasty); a stone was subsequently passed from the left side. Retrograde pyelography 18 months after operation disclosed a considerable reduction in the size of the kidney, which secreted clear urine.

In the fourth, a woman of 35, the incision discharged urine ten weeks after operation; at cystoscopy a piece of necrotic tissue was seen protruding from the ureteral meatus. Closure of the fistula followed extraction of the necrotic tissue and ureteral dilatation.

In the fifth patient, a woman of thirty, operation was a failure due to a technical blunder. She had a stricture at the ureteropelvic junction, another in the upper third of the ureter, and a third at the upper margin of the sacrum. Repeated ureteral dilatations proving fruitless, Y-plasties were done on the upper two strictures and a nephrostomy made with a plain catheter, with the intention of repairing the third stricture later. An extravasation of urine followed slipping of the tube, and nephrectomy had to be done some months later for a renal fistula.

Discussion

DR. FREDERIC E. B. FOLEY, St. Paul (by invitation): Naturally Dr. Creevy's presentation is gratifying to me for it makes a fine endorsement of the operation I devised. As my operation played such an important part in his presentation, modesty forbids me to further compliment it. I hope the others will.

The fact is that the results reported by Dr. Creevy in his 9 cases and the results secured in my own twenty operations in nineteen patients are so vastly superior to the results of most plastic operations for this condition that it is quite remarkable. On the whole the results in these twenty-nine plastic operations have been almost

uniformly good and only 1 secondary nephrectomy, as reported by Dr. Creevy, was required. This is something new for plastic operations.

Offhand one would think that results so superior to those secured with other operations mean that the particular form of operation itself is responsible. I would like to believe this but am not sure of it. I have seen other forms of plastic operation executed in other hands and have noted the crudeness of the suturing and the coarse suture material used. I marvel that a single good result could be secured with such technic. Dr. Creevy and I have used very fine chromic catgut (0000) on an atraumatic needle as prepared for me by Davis and Geck. We have placed the interrupted sutures very closely and have made them embrace only the muscularis, with careful avoidance of the mucosa. Meticulous care in this detail probably gives healing in exact apposition and without inflammatory infiltration the result of foreign body reaction. I am not so sure that this particular detail of technic rather than the plan of operation is not the thing responsible for our good results.

My further comments I wish to illustrate with lantern slides.

All of the plastic operations for correction of stricture at the ureteropelvic junction which have been described are adoptions from general surgery and do not represent contributions of anything fundamentally new. In reviewing them it becomes apparent how the procedures of general surgery have been appropriated to this purpose and how the several methods have come about through a natural evolution. As shown here, end-to-side anastomosis was employed in various viscera before its application as pyeloneostomy by Kuster in 1891.

The principle of longitudinal incision and transverse suture was employed as a pyloroplasty in the Heineke-Mikulicz operation before it was adopted for use at the uretero-pelvic junction by Fenger.

The principle of continuous side-to-side union was used in various plastic procedures before its application as a pyloroplasty by Finney and later its use as a pelvio-ureteroplasty—a particular form of operation for junction stricture popularized by Von Lichtenberg.

There is actually very little difference between the longitudinal incision and transverse suture of a straight incision and the same plastic principle applied to a Y incision. A Y incision is really a longitudinal incision with split end giving a V-shaped flap which is slid into the lower angle of the incision and so minimizes the distortion that occurs with transverse suture of an unsplit incision.

Durante applied the Y plastic as a pyloroplasty before its use at the ureteropelvic junction by Schwyzer.

There is the same difference between the Fenger and Finney operations as there is between the Schwyzer operation and mine. In the Fenger operation using a straight incision and in the Schwyzer operation using a Y incision, the incision is made in one plane and the tissues are moved in this same plane into new relations for suturing but inevitably with some degree of puckering and distortion. In the Finney operation using a straight incision and in mine using a Y incision, the incision is made in two planes and the two planes each containing an opening, the results of incision are directly opposed to each other for suture with no distortion whatever.

(Slide) This shows the difference between Dr. Schwyzer's original application of the Y plastic at the ureteropelvic junction and the operation which I have devised. It will be noted that in Dr. Schwyzer's plan the incision is made in one plane while in mine it is made in two planes. In the Foley operation the stem of the incision is placed in the lateral wall of the ureter standing opposite the medial wall of the pelvis. It extends through the ureteropelvic junction and is turned

TRANSACTIONS OF MINNEAPOLIS SURGICAL SOCIETY

RESULTS OF OPERATIONS

	Years Since Operation	Grade Hydro-Nephrosis	CHECK-UP PYLEOGRAM		SYMPTOMATIC RELIEF		
			Result	Time After Operation	Result	Time After Operation	
1	13	4	Excellent	13 Yrs.	Excellent	13 Yrs.	
2	11	3	Excellent	10 Yrs.	Excellent	10 Yrs.	
3	9	2	Excellent	1 1/2 Yrs.	Excellent	3 1/2 Yrs.	Death 3 1/2 Yrs. of Other Cause.
4	7	2	Fair	7 Yrs.	Good	7 Yrs.	
5	7	1	Poor	2 Mos.	Poor	6 Yrs.	
6	6	3-4	Excellent	6 Yrs.	Excellent	6 Yrs.	
7	6	2	Good	2 Mos.	Excellent	6 Yrs.	
8	6	3-4	Excellent	24 days			Postoperative Death 24 Days.
9	6	3	Excellent	1 Yr.	Excellent	5 Yrs.	
10	3	3-4	Fair	3 Yrs.	Excellent	3 Yrs.	
11	3	3					Postoperative Death 4 Days.
12	3	3-4	Fair	2 Yrs.	Good	2 Yrs.	
13	2	3	Fair	1 Mo.	Excellent	5 Mos.	Death 5 Mos. of Other Cause.
14	2	2-3	Good	1 Yr.	Excellent	1 Yr.	
15	1	2-3	Fair	7 Mos.		7 Mos.	
16	L 1/2	2-3	Good	6 Mos.	Excellent	8 Mos.	
	R 1/2	2	Fair	3 Mos.	Excellent	5 Mos.	
17	1/2	1	Good	4 Mos.	Excellent	7 Mos.	
18	1/4	4	Fair	3 Mos.	Excellent	3 Mos.	
19	1-12	3	Good	1 Mos.	Excellent	1 Mo.	

downward into a second plane represented by the medial wall of the pelvis below the junction.

(Slide) It appears that the lowering of the uretero-pelvic junction which this method accomplishes is of importance. If the high insertion of the ureter is not corrected a membrane valve results similar to the ureterovesical valve. When the pelvis fills under tension the valve loses and impedes the passage of urine into the ureter in the same way that the ureterovesical valve prevents regurgitation of urine from bladder into ureter.

In addition to widening the stricture the operation accomplishes three things which should be regarded as desirable in any operation for this purpose. It avoids puckering, it gives gradual funneling of pelvis into ureter and it corrects the high insertion of the ureter.

(Slide) This and other lantern slides of the pre-operative and post-operative pyelograms, together with comment, will demonstrate the results achieved in some of my cases.

It will be noted from the description of the operative technic that the method is best applicable in cases of high insertion of the ureter providing a segment of ureter below the junction lying in contact with the pelvis. These relations are not found in all cases. By certain modifications it is usually possible to well suit the procedure to the condition found. (Slide) For example, in this case a sacculi of dilated pelvis with adhesions about it bulged medially downward over the ureteropelvic junction. With the modification of technic illustrated here it was possible to apply the operation to this rather unusual situation.

(Slide) In this case the strictured junction entered a dependent portion of the extrarenal pelvis with insufficient room between the junction and sinus renalis in

which to make the Y incision. By resecting the parenchyma covering the intrarenal portion of the pelvis and the inferior calyx, a surface in which to place the Y incision was exposed and the technic was executed in the usual way. The post-operative pyelogram shows the result a few weeks later.

This tabulation shows the results of the twenty operations in nineteen different cases. Of the nineteen patients fifteen are living at the present time. It will be noted that the anatomic condition following operation has been determined in all cases except one of early postoperative death and that in a substantial number of the cases this check-up determination of anatomic condition was made at a long interval following operation. In these cases the result noted should be regarded as the permanent end-result. Symptomatic relief as determined by follow-up information from the patient was obtained in all cases, many of them at long intervals following operation. It will be noted that the symptomatic result was excellent or good except in one case with poor result and in one case, the fifteenth, in which there was no preoperative complaint of pain.

OPERATIONS SIX OR MORE YEARS AGO

(Seven Surviving Patients)

	Functional and Anatomic Result	Symptomatic Result
Excellent	4	5
Good	1	1
Fair	1	0
Poor	1	1

This is a tabulation of functional and anatomic results and symptomatic results in the seven surviving patients who were operated upon six or more years ago.

OPERATIONS LESS THAN SIX YEARS AGO

(Eight Surviving Patients; Nine Operations)

	Functional and Anatomic Result	Symptomatic Result
Excellent	0	7
Good	4	1
Fair	5	0
Poor	0	0

This is a tabulation of functional and anatomic results and symptomatic results in the eight surviving patients who were operated upon less than six years ago.

Many of the check-up pyelograms have not shown the decrease of pelvic capacity that one might consider a criterion of good result. Actually diminution of pelvic capacity is not a true criterion of good result. If the obstruction is relieved and the resistance to the outflow of urine from the pelvis is removed the operation has accomplished its purpose. In a vast majority of these cases this appears to have been attained and has been marked by complete symptomatic relief and improved function as determined by dye excretion tests. An accompanying decrease of pelvic capacity is gratifying but not essential to appraising a result excellent.

DR. ARNOLD SCHWYZER, St. Paul (by invitation): Maybe some of you who have not done the operation think that it is an intricate affair, but this is not the case. I want to express my great gratification for hearing these two speakers. In fact, I could not disagree with a single thing that Dr. Creevy has said, except that Dr. Allmann was a German.

DR. CREEVY: He must have been a Swiss.

DR. SCHWYZER: When I was abroad I saw three cases of hydronephrosis where the kidney had been removed, and I was amazed how small these hydronephroses were. It seemed to me a plastic could have been done. If you have the ureter here, and here the pelvis (illustrating with his hand) the junction of the two is often a quite narrow place and there will often be fibrous tissue around it. You want to be sure that you are not going to have a second stricture here. If you only cut it longitudinally and sew it transversely, you will probably have some puckering and the same story afterward. If you make a longitudinal incision through the ureteropelvic junction and then at the upper end of this incision continue it by two diverging cuts, a flap is thus formed from the pelvis. You bring the flap from the pelvis down, with a stitch fastening the tip of the flap to the lower end of the longitudinal incision. Even if the suturing should not be very exact, the flap will stay there. Even if there should be a leak, it will stay there anyway. The epithelium is there as you have the flap at the ureteropelvic junction. This is the important point. I was glad to hear Dr. Creevy state that he didn't think that the high implantation of the ureter was primary. Imagine that you have some retention in a normal pelvis of the kidney. You have connective tissue around the ureteropelvic junction. If it is a little stronger on one side than on the other the pelvis will bulge the weaker area. That will make the lower portion of the pelvis bulge easier and make the ureter look like abnormally implanted high in the pelvis.

Dr. Creevy showed pictures of the drainage tubes. The catheters for drainage were inserted in one picture into the pelvis and in others through the cortex. You don't want to bother the pelvis. It is in the pelvis that almost all the kidney stones are formed. Very

rarely one sees one in the parenchyma. For this reason it is best to leave the pelvis alone as much as possible. Make a small incision through the cortex and your catheters will not bother. Do not irritate the pelvis at all. Infection was also mentioned. Infection is a mean thing in these cases. But I have had two cases where the operation mentioned could be done anyway. In the first case the hydronephrosis contained about one pint. There was considerable pus and some fever. I saw this woman not so long ago, a little over twenty years after the operation, and she is in good health. Another case, a girl about eight years old, was brought in with a high fever, some over 103°. She had an acute hydronephrosis with pyelitis, and severe pain. The patient made a good recovery even though I had to operate in the acute stage.

DR. GILBERT J. THOMAS: Urologists have gone conservative and are gradually eliminating many of their surgical jobs. Stones in the kidney are being dissolved, the prostate is being partially removed by instruments and not by open operations, and now we have a surgical method of saving kidneys that were formerly removed surgically when obstruction occurred at the ureteropelvic junction. When we read Dr. Creevy's paper, we will get a much better idea of his technic and the reasons for the excellent results he has obtained.

Are these bands at the ureteropelvic junction acquired, or are some of them congenital? The pyelo-ureterogram may show distinctly that there is a temporary block at the ureteropelvic junction when shadow-casting solutions are introduced, but the surgeon may be disappointed when the ureters are explored without opening, to find that the lumen looks normal in size. One is quite surprised after an incision is made through this area to find within the lumen very definite obstruction.

When a kidney has been incapacitated because of obstruction for a long period of time, its function is taken over by its mate. When this has occurred, it is supposed that the relief from obstruction by surgical procedure will not bring back the function of the injured kidney. In certain instances when a plastic operation at the ureteropelvic junction fails, this is because enough of the function has been destroyed so that the kidney cannot recover sufficiently and the pelvis does not drain well, even with a very wide opening. Another point in technic that I wish to emphasize is thorough drainage of the kidney and its pelvis. After a plastic operation is done at the ureteropelvic junction, the best results in my experience are obtained when I have carried a tube well down into the ureter and out through a nephrostomy wound. This splinting of the operative area is very important. Put in a tube that does not fit too well, but still large enough to keep the ureteropelvic junction open, and drain the pelvis thoroughly so that it will not dilate and thus open the line of suture. I think this drainage through the line of incision and closure is more important than the careful closure. Unless you anchor the drainage tubes securely, which you put into the pelvis only, they will frequently come out. I think there are some cases that require partial resection of the overdistended pelvis at the time of operation.

Dr. Creevy has taken the operation described by Dr. Foley and Dr. Schwyzer and has used it well.

E. A. REGNIER, Secretary.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

A MEDICAL FORMULARY. Fourteenth Edition. E. Quin Thornton, M.D., Emeritus Professor of Therapeutics, Jefferson Medical College, Philadelphia. 363 pages. Price, \$2.75, flexible binding. Philadelphia: Lea & Febiger, 1937.

HEMOPHILIA, Clinical and Genetic Aspects. Carroll LaFleur Birch, M.D. Assistant Professor of Medicine. 151 pages. Illus. Price, \$2.00 paper bound, \$2.50 cloth bound. Urbana, Ill.: University of Illinois Press, 1937.

WHY WE DO IT. An elementary discussion of human conduct and related physiology. Edward C. Mason, M.D., Ph.D., F.A.C.P. Professor of Physiology, University of Oklahoma School of Medicine, Oklahoma City. 177 pages. Price, cloth, \$1.50. St. Louis: C. V. Mosby Co., 1937.

FAISCEAU ENERGETIQUE ET BIOLOGIE. Biogenese et Pathogenese. Docteur G. Froin, Ancien Interne des Hopitaux de Paris. 327 pages. Illus. Paper cover. Paris: Librairie Girardot et Cie, 1937.

SYNOPSIS OF ANO-RECTAL DISEASES. By Louis J. Hirschman. St. Louis, Mosby, 1937. \$3.50. 288 p. Illus.

This volume is prepared with the intention of aiding the medical student as well as the general practitioner in the diagnosis and treatment of the commoner diseases of the anus and rectum.

It is pithy, concisely worded and well illustrated. The author takes up the diagnosis and treatment of ano-rectal diseases in the usual fashion. He discusses anatomy, symptomatology, examination, anesthesia and the various diseases of the rectum in their order. There is a detailed chapter on anesthesia followed by an excellent chapter on the limitations of local anesthesia and office treatment.

The author emphatically insists on a thorough examination of the anus, rectum and sigmoid in the general examination of the patient and demonstrates the ease with which this can be done with a little practice.

This volume is to be highly recommended to the general practitioner because the author gives a detailed, step-by-step outline of treatment accompanied by clear illustrations, and for the fact that practically all treatments given in the book can be accomplished in the office.

H. A. GREENBERG, M.D.

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